

2013

SOUTH CAROLINA AQUATIC PLANT  
MANAGEMENT PLAN



Prepared by the  
Aquatic Nuisance Species Program  
South Carolina Department of Natural Resources  
and Approved by the  
South Carolina Aquatic Plant Management Council  
2013

## **2013 SOUTH CAROLINA AQUATIC PLANT MANAGEMENT COUNCIL**

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## PART II - 2013 ANNUAL MANAGEMENT PLAN

### INTRODUCTION

The Annual Management Plan for 2013 was developed by application of the procedures described in the Aquatic Plant Management Plan, Part I (Procedural Management Plan). The phases of development of the Annual Management Plan include 1) identification of areas where aquatic plants interfere with water use, 2) development of a description of each problem area, 3) development of a management strategy for each problem area, and 4) determination of the distribution of available funding among problem areas.

#### Common and Scientific Names of Aquatic Plants Referenced in the Plan

Alligatorweed	<i>Alternanthera philoxeroides</i>
Bladderwort	<i>Utricularia</i> spp.
Brazilian elodea	<i>Egeria densa</i>
Bur Marigold	<i>Bidens</i> spp.
Spatterdock	<i>Nuphar luteum macrophyllum</i>
Cattails	<i>Typha</i> spp.
Coontail	<i>Ceratophyllum demersum</i>
Common reed	<i>Phragmites australis</i>
Creeping rush	<i>Juncus repens</i>
Crested Floating-heart	<i>Nymphoides cristata</i>
Curly-leaf pondweed	<i>Potamogeton crispus</i>
Duckweed	<i>Lemna</i> spp.
Eurasian watermilfoil	<i>Myriophyllum spicatum</i>
Fanwort	<i>Cabomba caroliniana</i>
Filamentous algae	<i>Pithophora</i> , <i>Lyngbya</i> , <i>Hydrodictyon</i>
Floating bladderwort	<i>Utricularia inflata</i>
Floating heart	<i>Nymphoides</i> spp.
Frog's bit	<i>Limnobiium spongia</i>
Giant cutgrass	<i>Zizaniopsis miliacea</i>
Hydrilla	<i>Hydrilla verticillata</i>
Lotus	<i>Nelumbo lutea</i>
Musk-grass	<i>Chara</i> spp.
Pondweed	<i>Potamogeton</i> spp.
Slender naiad	<i>Najas minor</i>
Smartweed	<i>Polygonum densiflorum</i>
Southern naiad	<i>Najas guadalupensis</i>
Spikerush	<i>Eleocharis</i> spp.
Stonewort	<i>Nitella</i>
Variable-leaf pondweed	<i>Potamogeton diversifolius</i>
Waterlily	<i>Nymphaea odorata</i>
Water hyacinth	<i>Eichhornia crassipes</i>
Water lettuce	<i>Pistia stratiotes</i>
Watermilfoil	<i>Myriophyllum</i> spp.
Water pennywort	<i>Hydrocotyle ranunculoides</i>
Water primrose	<i>Ludwigia hexapetala</i>
Watershield	<i>Brasenia schreberi</i>

## Aquatic Plant Problem Areas

Areas where aquatic plants interfere with water use were identified from information provided by S.C. Aquatic Plant Management Council members, an aquatic plant survey conducted by the S.C. Department of Natural Resources staff and public input. The identified problem areas listed below are open to access and use by the public and are therefore considered by the Council as eligible for some type of public funding. Acres of infestation (coverage) are approximations based on observations made in 2012

**SPECIAL NOTE: Due to 2013 budget constraints and in an effort to continue to serve all of the areas around the state; each water body will only be eligible for up to \$30,000 of cost share money from the SCDNR.**

- 1) Water body - Back River Reservoir
  - Location - Berkeley County
  - Surface acres - 850
  - Aquatic plants - Hydrilla, Water hyacinth, Water primrose, Fanwort
  - Coverage - 360 acres
  - Impaired activities- Boating, fishing, hunting, swimming, industrial water supply, municipal water supply, electric power generation, public access
- 2) Water body - Baruch Institute
  - Location - Georgetown County
  - Surface acres - Unknown, adjacent to Winyah Bay
  - Aquatic plants - Phragmites
  - Coverage - 25 acres
  - Impaired activities - Boating, hunting, fishing, public access
- 3) Water body - Black Mingo Creek
  - Location - Georgetown County
  - Surface acres -Unknown
  - Aquatic plants - Alligatorweed, Parrot feather
  - Coverage - 5 acres
  - Impaired activities - Boating, hunting, fishing, public access
- 4) Water body - Black River
  - Location - Georgetown County
  - Surface acres -Unknown
  - Aquatic plants - Alligatorweed
  - Coverage – 10 acres
  - Impaired activities - Boating, hunting, fishing, public access
- 5) Water body - Bonneau Ferry
  - Location - Berkeley County
  - Surface acres -Unknown - Multiple Reserves and impoundments
  - Aquatic plants - Water hyacinth, Water primrose, Frog's bit, Lotus, Cat-tails, Cutgrass, Pennywort, Parrotfeather, Fanwort, Coontail
  - Coverage - 40 acres

- Impaired activities - Boating, hunting, fishing, public access
- 6) Water Body – Caw Caw Interpretative Center  
Location – Charleston County  
Surface acres – unknown  
Aquatic plants - Hydrilla, Water primrose, Water hyacinth, Phragmites, Tallow  
Coverage - 10 acres  
Impaired activities – Recreational and public access
- 7) Water body - Combahee River (Borrow pit)  
Location - Colleton County  
Surface acres - approx. 5 acres  
Aquatic plants - Hydrilla, Water primrose, Water hyacinth  
Coverage - 4 acres  
Impaired activities - Boating, hunting, fishing, public access
- 8) Water body - Cooper River (and adjacent ricefields)  
Location - Berkeley County  
Surface acres - Unknown  
Aquatic plants - Hydrilla, Water primrose, Water hyacinth  
Coverage - approx. 2,800 acres  
Impaired activities - Boating, hunting, fishing, public access
- 9) Water body - Donnelley/Bear Island WMA  
Location - Colleton County  
Surface acres - Multiple impoundments and rivers  
Aquatic plants - Cutgrass, Frog's bit, Cattails, Phragmites  
Coverage - 40 acres  
Impaired activities - Hunting, public access
- 10) Water body - Dungannon Plantation Heritage Preserve  
Location - Charleston County  
Surface acres - Unknown  
Aquatic plants - Cutgrass, Frog's bit, Cattails, Water primrose, Swamp loosestrife  
Coverage - 14 acres  
Impaired activities - Wood stork nesting site, public access
- 11) Water body - Goose Creek Reservoir  
Location - Berkeley County  
Surface acres - 600  
Aquatic plants - Water hyacinth, Water lettuce, Water primrose, Hydrilla, *Salvinia minima*  
Coverage - 180 acres  
Impaired activities - Boating, public access, industrial water supply, floodway
- 12) Water body – Lake Bowen  
Location - Spartanburg County  
Surface acres - 1534  
Aquatic plants – Muskgrass(*Chara*)



- Coverage - 40 acres  
Impaired activities- Boating, fishing, hunting, swimming, industrial water supply, municipal water supply, public access
- 13) Water body – Lake Cunningham  
Location - Greenville County  
Surface acres -160 acres  
Aquatic plants – Brazilian elodea, Water primrose, Waterlily spatterdock  
Coverage – 10 acres  
Impaired activities - Boating, hunting, fishing, public access
- 14) Water body - Lake Greenwood  
Location -Laurens and Greenwood Counties  
Surface acres - 11,400  
Aquatic plants - Hydrilla, Slender naiad  
Coverage - <5 acres  
Impaired activities – Potential impacts to electric power generation, boating, swimming, vector control, public access
- 15) Water body - Lake Keowee  
Location – Pickens and Oconee Counties  
Surface acres – 18,300 acres  
Aquatic plants - Hydrilla  
Coverage - <5 acres  
Impaired activities - Potential impacts to electric power generation, municipal water supply, boating, swimming, vector control, public access
- 16) Water body - Lake Monticello(RecreationLake)  
Location - Fairfield County  
Surface acres – 6,700 acres(300 acres)  
Aquatic plants - Hydrilla  
Coverage - 25 acres (Recreation Lake)  
Impaired activities - Boating, swimming, fishing, vector control, public access
- 17) Water body - Lake Murray  
Location - Lexington and Richland Counties  
Surface acres - 50,000  
Aquatic plants - Hydrilla, Illinois pondweed, Water primrose, Alligatorweed  
Coverage - 50 acres  
Impaired activities - Boating, swimming, domestic and municipal water intakes, public access
- 18) Water body - Lake Wateree  
Location – Kershaw County  
Surface acres – 13,710 acres  
Aquatic plants – Hydrilla, cutgrass  
Coverage - <5 acres  
Impaired activities - Potential impacts to boating, swimming, vector control, public access
- 19) Water body - Little Pee Dee River

- Location - Marion and Horry Counties
- Surface acres - Unknown
- Aquatic plants - Alligatorweed
- Coverage - 30 acres
- Impaired activities - Boating, hunting, fishing, public access
- 20) Water body - Lumber River
  - Location - Marion and Horry Counties
  - Surface acres - Unknown
  - Aquatic plants - Alligatorweed
  - Coverage - 5 acres
  - Impaired activities - Boating, hunting, fishing, public access
- 21) Water body - Pee Dee River
  - Location - Georgetown County
  - Surface acres - Unknown
  - Aquatic plants - Water hyacinth, Phragmites
  - Coverage - 40 acres
  - Impaired activities - Boating, hunting
- 22) Water body - Samworth WMA
  - Location - Georgetown County
  - Surface acres - Unknown
  - Aquatic plants - Phragmites, Water hyacinth
  - Coverage - 50 acres
  - Impaired activities - Hunting, public access
- 23) Water body - Santee Coastal Reserve
  - Location - Georgetown County
  - Surface acres - Unknown
  - Aquatic plants - Phragmites
  - Coverage - 300 acres
  - Impaired activities - Hunting, public access
- 24) Water body - Santee Delta WMA
  - Location - Georgetown County
  - Surface acres - Unknown
  - Aquatic plants - Phragmites
  - Coverage - 50 acres
  - Impaired activities - Hunting, public access
- 25) Water body - US Army Corps of Engineers - Charleston Harbor/Intracoastal Waterway
  - Location - Charleston County
  - Surface acres - Unknown
  - Aquatic plants - Phragmites
  - Coverage – 200+ acres
  - Impaired activities - Boating, hunting, fishing, public access
- 26) Water body - US Naval Weapons Station

Location - Charleston and Berkeley Counties

Surface acres - Unknown

Aquatic plants - Frog's-bit, Water primrose, Water hyacinth, Phragmites

Coverage - 75 acres

Impaired activities - Boating, hunting, fishing, public access

27) Water body - Waccamaw River

Location - Georgetown and Horry Counties

Surface acres - Unknown

Aquatic plants - Water hyacinth, Phragmites

Coverage - 50 acres

Impaired activities - Boating, hunting, fishing, public access

28) Water body - Yawkey Wildlife Center

Location - Georgetown County

Surface acres - Unknown

Aquatic plants - Phragmites

Coverage - 25 acres

Impaired activities - Hunting, public access

### **Santee Cooper Lakes**

29) Water body - Lake Marion

Location - Sumter, Clarendon, Calhoun, Berkeley, and Orangeburg Counties.

Surface acres - 110,000

Aquatic plants - Alligatorweed, Brazilian elodea, Hydrilla, Water primrose, Slender naiad, Coontail, Water hyacinth, Filamentous algae, Fanwort, Cutgrass, Crested floating heart

Coverage - 2350 acres

Impaired activities - Boating, swimming, public access, potential electric power generation, potential irrigation water withdrawals

30) Water body - Lake Moultrie

Location - Berkeley County

Surface acres - 60,400

Aquatic plants - Alligatorweed, Water primrose, Brazilian elodea, Hydrilla, Slender naiad, Water hyacinth, Watermilfoil, Fanwort, Cutgrass, Crested floating heart

Coverage - 400 acres

Impaired activities - Potential electric power generation, boating, swimming, public access, potential domestic and irrigation water withdrawals

### **SC Parks, Recreation and Tourism - State Park Lakes**

31) Water body - Aiken State Park

Location - Aiken County

Surface acres - 16

Aquatic plants – Floating heart

- Coverage - 10 acres  
Impaired activities - Fishing, swimming, aesthetics
- 32) Water body - Barnwell State Park  
Location - Barnwell County  
Surface acres - 12  
Aquatic plants – Waterlily, Cattails  
Coverage - 9 acres  
Impaired activities - Fishing, swimming, aesthetics
- 33) Water body - Charles Towne Landing State Park  
Location - Charleston County  
Surface acres - 5  
Aquatic plants - Duckweed, Alligatorweed, Pennywort, Cyanobacteria, Algae  
Coverage - 4 acres  
Impaired activities - Fishing, tourism, aesthetics
- 34) Water body - Cheraw State Park  
Location - Chesterfield County  
Surface acres - 280  
Aquatic plants – Floating heart, Waterlily, Spatterdock, Watermilfoil  
Coverage - 20 acres  
Impaired activities - Fishing, swimming, aesthetics
- 35) Water body - Croft State Park  
Location - Spartanburg County  
Surface acres - 145  
Aquatic plants – Hydrilla  
Coverage - 50 acres  
Impaired activities - Fishing, swimming, aesthetics
- 36) Water body - H. Cooper Black Recreation Area  
Location - Chesterfield County  
Surface acres - 2 acres  
Aquatic plants - Spatterdock  
Coverage - 1 acres  
Impaired activities - Recreational activities
- 37) Water body – Hunting Island State Park  
Location - Beaufort County  
Surface acres - 1  
Aquatic plants – Duckweed  
Coverage - 1 acres  
Impaired activities - Fishing, swimming, aesthetics
- 38) Water body - Huntington Beach SP  
Location - Horry County  
Surface acres - 15 acres  
Aquatic plants - Cutgrass, Phragmites, Cattails

- Coverage - 15 acres  
Impaired activities - Recreational activities
- 39) Water body – Jones Gap State Park  
Location - Greenville County  
Surface acres - 1  
Aquatic plants – Kudzu  
Coverage - 1 acres  
Impaired activities - Fishing, swimming, aesthetics
- 40) Water body - Kings Mountain State Park - Crawford Lake  
Location - York County  
Surface acres - 9  
Aquatic plants - Slender naiad  
Coverage - 4 acres  
Impaired activities - Swimming, boating
- 41) Water body - Lee State Park  
Location - Lee County  
Surface acres – 1.75  
Aquatic plants – Watermilfoil  
Coverage – 2 acres  
Impaired activities - Fishing, swimming, aesthetics
- 42) Water body - Little Pee Dee State Park  
Location - Dillon County  
Surface acres - 75  
Aquatic plants - Spikerush, Spatterdock  
Coverage - 15 acres  
Impaired activities - Fishing, boating
- 43) Water body - N.R. Goodale State Park  
Location - Kershaw County  
Surface acres - 160 acres  
Aquatic plants - Waterlily, Watershield  
Coverage - 60 acres  
Impaired activities - Swimming, recreational activities
- 44) Water body – Paris Mountain State Park  
Location - Greenville County  
Surface acres – 9.5  
Aquatic plants – Slender naiad, Watershield  
Coverage - 6 acres  
Impaired activities - Fishing, swimming, aesthetics
- 45) Water body - Poinsett State Park  
Location - Sumter County  
Surface acres - 9  
Aquatic plants – Spatterdock, Cattails

Coverage - 5 acres

Impaired activities - Fishing, swimming, aesthetics

46) Water body - Sesquicentennial State Park

Location - Richland County

Surface acres - 25 acres

Aquatic plants - Waterlily, Watershield

Coverage - 12 acres

Impaired activities - Swimming, fishing

**SC Department of Natural Resources - State Lakes**

47) Water body - Lake Cherokee

Location - Cherokee County

Surface acres - 50 acres

Aquatic plants - Water primrose

Coverage - 5 acres

Impaired activities - Boating, fishing

48) Water body - Lake Edwin Johnson

Location - Spartanburg County

Surface acres - 40 acres

Aquatic plants - Water primrose, Hydrilla, Pondweed

Coverage - 10 acres

Impaired activities - Boating, fishing

49) Water body - Jonesville Reservoir

Location - Union County

Surface acres - 25 acres

Aquatic plants - Water primrose, Pondweed

Coverage - 10 acres

Impaired activities - Boating, fishing

50) Water body - Mountain Lakes

Location - Chester County

Surface acres - 70 acres

Aquatic plants - Water primrose, Alligatorweed, Parrotfeather

Coverage - 5 acres

Impaired activities - Boating, fishing

51) Water body - Lancaster Reservoir

Location - Lancaster County

Surface acres - 61 acres

Aquatic plants - Water primrose, Alligatorweed

Coverage - 8 acres

Impaired activities - Boating, fishing, hunting

52) Water body - Sunrise Lake

- Location - Lancaster County
- Surface acres - 25 acres
- Aquatic plants - Pondweed
- Coverage - 15 acres
- Impaired activities - Boating, fishing
- 53) Water body - Lake Ashwood
  - Location - Lee County
  - Surface acres - 75 acres
  - Aquatic plants - Waterlily
  - Coverage - spotty
  - Impaired activities - Boating, fishing
- 54) Water body - Lake Edgar Brown
  - Location - Barnwell County
  - Surface acres - 100 acres
  - Aquatic plants - Water primrose, Coontail
  - Coverage - 60 acres
  - Impaired activities - Boating, fishing
- 55) Water body - Lake George Warren
  - Location - Hampton County
  - Surface acres - 400 acres
  - Aquatic plants - Cattails, Water primrose, Coontail
  - Coverage - 20 acres
  - Impaired activities - Boating, fishing
- 56) Water body - Lake Thicketty
  - Location - Cherokee County
  - Surface acres - 100 acres
  - Aquatic plants - Hydrilla
  - Coverage - 5 acres
  - Impaired activities - Boating, fishing
- 57) Water body - Dargan's Pond
  - Location - Darlington County
  - Surface acres - 50 acres
  - Aquatic plants - Pondweed
  - Coverage - 15 acres
  - Impaired activities - Boating, fishing

#### **South Carolina Border Lakes**

- 58) Water body - Lake Wylie
  - Location – York County, SC; Gaston and Mecklenburg County, NC
  - Surface acres – 13,443 acres
  - Aquatic plants - Hydrilla

Coverage - <400 acres(all in NC waters)

Impaired activities - Potential impacts include electric power generation, boating, swimming, public access, domestic and irrigation water withdrawals

59) Water body - Lake Thurmond

Location – South Carolina, Georgia Border

Surface acres – 71,100 acres

Aquatic plants - Hydrilla

Coverage - > 7000 acres

Impaired activities - Potential impacts include electric power generation, boating, swimming, public access, domestic and irrigation water withdrawals



## AQUATIC PLANT MANAGEMENT STRATEGY

The following management strategies were developed for each identified problem area considered eligible for public funding. Planned expenditures are based on known available federal funds, estimated state funds and anticipated local support as of the date of this plan. For water bodies in which final funding is inadequate to conduct all proposed control operations, the extent of control will be reduced and priority areas and target plants will be determined by the Department of Natural Resources in cooperation with the local sponsor. A summary of proposed expenditures for 2013 and a location map of problem water bodies are located at the end of this section.

**SPECIAL NOTE:** Due to continuing budget constraints (in an effort to serve all of the areas around the state) each water body will only be eligible for up to \$30,000 of cost share money from the SCDNR.

### Public Waters

#### 1. Back River Reservoir (Berkeley County)

##### Problem plant species

Hydrilla, Water hyacinth, Fanwort, Water primrose, Frog's bit, Cutgrass

##### Management objectives

Reduce water hyacinth and water primrose populations throughout the lake to enhance public access, navigation, water flow and minimize impacts to water intakes from floating islands.

Reduce hydrilla in upper Foster Creek area to improve water quality, water flow and navigation.

Reduce hydrilla and fanwort in 62.50 acre area adjacent to SCE&G Williams Station intake to enhance water flow, minimize clogging of water intake, and enhance public boating and fishing use in this area.

Reduce hydrilla and fanwort in a 2 acre area at Bushy Park Landing to enhance public boating and fishing use in this area.

##### Selected control method

Problem Species	Control Agent
Water hyacinth	Renovate 3, Reward, Clearcast, Galleon SC, Habitat, Glyphosate
Water primrose, Cutgrass	Renovate 3, Reward, Habitat, Clearcast, Glyphosate
Hydrilla	Chelated copper*, Chelated copper*/Reward, Aquathol

May be toxic to fish at recommended treatment rates; however, precautions will be implemented to minimize the risk of fish kills.

##### Area to which control is to be applied

Renovate 3, Reward, Habitat, Clearcast, Glyphosate and Galleon SC - 300 acres of water hyacinth, water primrose and cutgrass throughout the lake.

Chelated copper\*/Reward, Galleon SC - 154 acres of hydrilla; 2 treatments of 62.50 acre area near SCE&G intake, 2 acres of hydrilla adjacent to Bushy Park Landing, 25 acres of hydrilla in Foster Creek arm (2 treatments-12.50 acres each).

#### **Rate of control agents to be applied**

Aquathol – 0.500 to 5 ppm

Renovate 3 - 0.500 - 0.750 gallons per acre.

Reward - 0.500 gallons per acre.

Clearcast - 0.250 - 0.750 gallons per acre.

Glyphosate - up to 0.937 gallons per acre.

Chelated copper - up to 1 ppm (about 10- 16 gallons per acre).

Chelated copper\*/Reward - 4 gallons/2 gallons per acre

Habitat – 0.250 - 0.750 gallons per acre.

Galleon SC - Submersed 0.174 fl oz/acre foot to achieve minimum effective concentration of 25 to 75 ppb, Floating species – 2 to 6 fl oz/acre as foliar application.

#### **Method of application of control agents**

Renovate 3, Reward, Habitat, Clearcast, Glyphosate and Galleon SC - spray on surface of foliage with appropriate surfactant.

Chelated copper, Chelated copper\*/Reward, Aquathol - subsurface injection from airboat.

#### **Timing and sequence of control application**

Three hundred (300) acres of water hyacinths, water primrose and cutgrass treated with Renovate 3, Clearcast, Habitat, Glyphosate, Galleon SC (May-October), Reward (October, November). The initial treatments are to be followed in 1-2 days with a cleanup treatment.

12.50 acres of hydrilla in Foster Creek to be treated 2 times (April-October) with Aquathol.

Hydrilla and fanwort located adjacent to public boat ramp to be treated with chelated copper.

Hydrilla located near the SCE&G water intake to be treated periodically during the year with Chelated copper, Chelated copper\*/diquat (up to three times in the same 62.50 acre area), treatment area may be expanded as control is realized in target are

#### **Other control application specifications**

Herbicide used only upon approval by the S.C. Department of Health and Environmental Control.

All herbicide treatments conducted within 1600 feet of the CPW water intake will use Renovate 3 at a rate of 0.5 gallons per acre or less or Galleon SC at a rate of 2 to 6 oz/acre. Reward treatments will be conducted at least 1600 feet from the intake. Following any application of Reward within 1600 feet of the CPW water intake, herbicide residue concentrations may be monitored according to a plan agreed to by the S.C. Department of Natural Resources,

Charleston Commissioners of Public Works(CPW), and the Department of Health and Environmental Control.

If filamentous algae are present on submersed macrophytes, an algaecide, such as K-TEA, will be used in addition to selected herbicides to assist in control.

Control is to be applied in a manner that will not significantly degrade water quality in the treatment area. This may involve treating only a portion of the area at any one time.

**Entity to apply control agents**

Commercial applicator

**Estimated cost of control operations**

\$45,000

**Potential sources of funding**

Water primrose and water hyacinths -

Charleston Commissioners of Public Works 30%

S.C. Electric and Gas Co. 20%

U.S. Army Corps of Engineers 0%

S.C. Department of Natural Resources 50% (up to \$30,000 cost share per waterbody)

(Percentage of match subject to change based on availability of Federal and State funding.)

Hydrilla and Cabomba (near SCE&G intake) -

S.C. Electric and Gas Co. 50%

U.S. Army Corps of Engineers 0%

S.C. Department of Natural Resources 50% (up to \$30,000 cost share per waterbody)

(Percentage of match subject to change based on availability of Federal and State funding.)

Hydrilla (Foster Creek, boat ramp, and Back River) -

Charleston Commissioners of Public Works 30%

S.C. Electric and Gas Co. 20%

U.S. Army Corps of Engineers 0%

S.C. Department of Natural Resources 50% (up to \$30,000 cost share per waterbody)

(Percentage of match subject to change based on availability of Federal and State funding.)

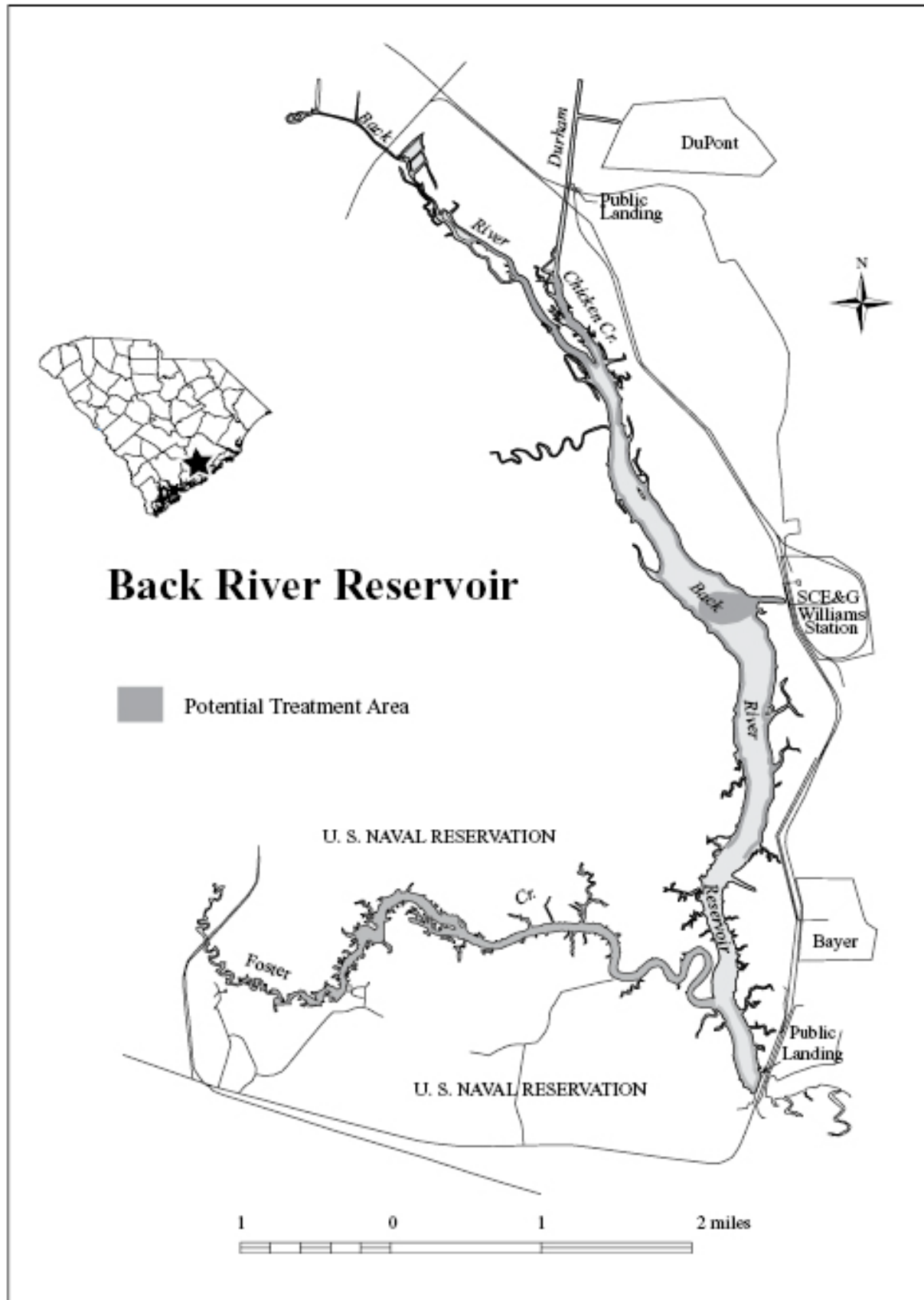
**Long term management strategy**

a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.

b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant

populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.

- c) Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.
- d) Effective long term control of water hyacinth in the reservoir must also include control of this species in the Cooper River to which the reservoir is connected.



## 2. Baruch Institute (Georgetown County)

### **Problem plant species**

Phragmites

### **Management objective**

Through a comprehensive, multi-year approach; reduce Phragmites populations to the greatest extent possible

### **Selected control method**

Problem Species	Control Agent
Phragmites	Habitat, Glyphosate, Clearcast

### **Area to which control is to be applied**

25 acres of phragmites throughout area

### **Rate of control agent to be applied**

Habitat - 0.250 - 0.750 gallons per acre.

Glyphosate - up to 0.937 gallons per acre.

Clearcast - up to 5 % solution for spot spray.

### **Method of application of control agent**

Helicopter - 25 acres of Habitat, Glyphosate, Clearcast applied to phragmites.

Other applications - Spray on surface of foliage with appropriate surfactant.

### **Timing and sequence of control application**

Apply when plants are actively growing (July - Oct.).

### **Other control application specifications**

None

### **Entity to apply control agent**

Commercial applicator

### **Estimated cost of control operations**

\$3,000

### **Potential sources of funding**

Baruch Institute 50%

U.S. Army Corps of Engineers 0%

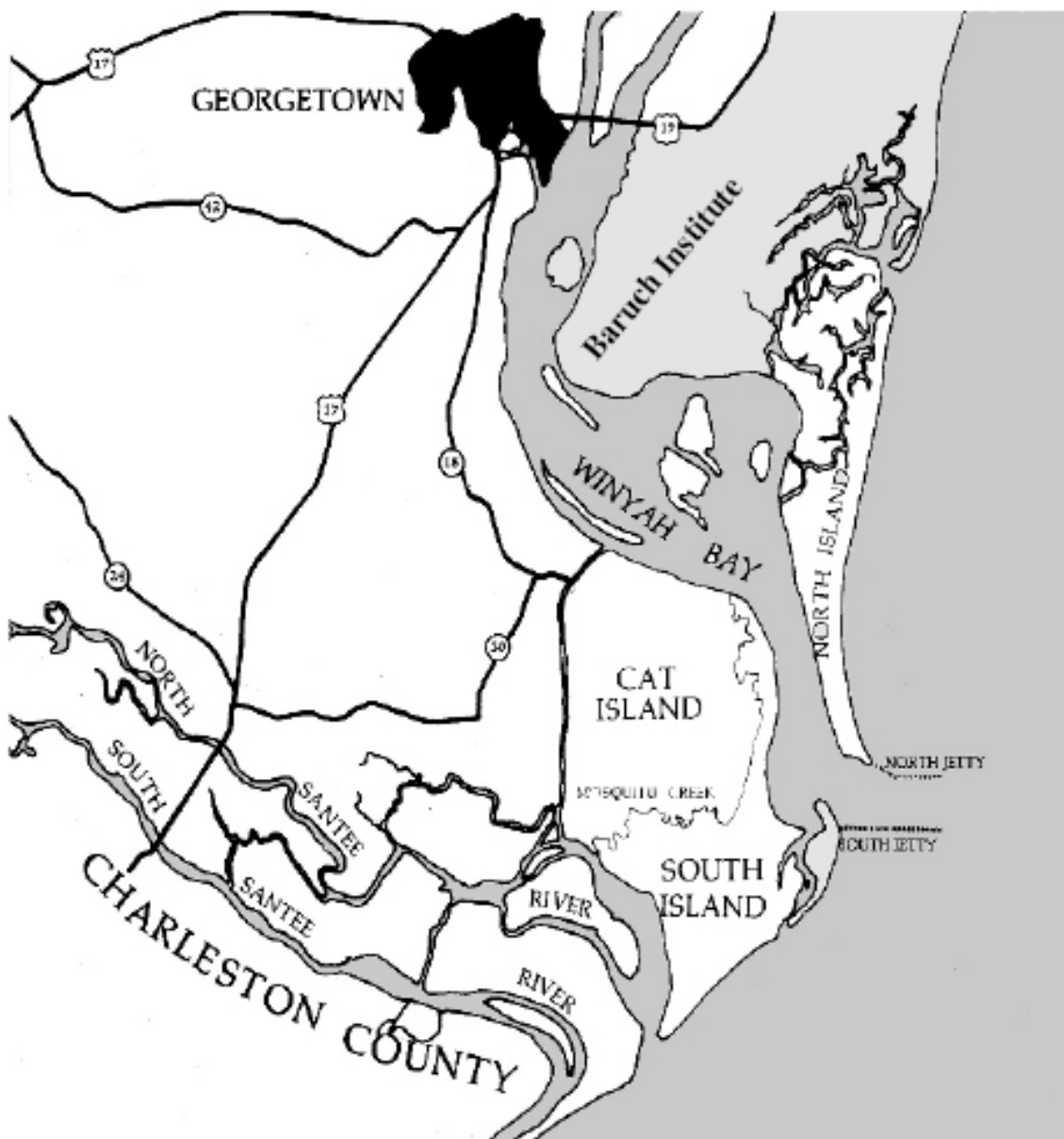
S.C. Department of Natural Resources 50% (up to \$30,000 cost share per waterbody)

(Percentage of match subject to change based on availability of Federal and State funding.)

**Long term management strategy**

- a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.
- c) Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.
- d) Continue to coordinate treatment areas with local conservation groups.

## Baruch Institute





### 3. Black Mingo Creek (Georgetown County)

#### Problem plant species

Alligatorweed, Parrot feather, Frog's bit, Pennywort

#### Management objective

Reduce or remove nuisance weed infestation at public access points, the main river channel, and connecting lakes to improve water quality and navigation.

#### Selected control method

Problem Species	Control Agent
Alligatorweed, Pennywort	Renovate 3, Habitat, Clearcast, Glyphosate
Frog's bit, Parrot feather	Reward, Galleon SC

#### Area to which control is to be applied

5acres of problematic plants throughout river

#### Rate of control agent to be applied

Reward - 0.500 gallon per acre.

Renovate 3 - 0.500 to 0.750 gallons per acre.

Habitat - 0.250 - 0.750 gallons per acre.

Clearcast - 1 to 4 pints per acre.

Glyphosate - up to 0.937 gallons per acre.

#### Method of application of control agent

Spray on surface of foliage with appropriate surfactant.

#### Timing and sequence of control application

Apply when plants are actively growing (May - Oct.).

#### Other control application specifications

None

#### Entity to apply control agent

Commercial applicator

#### Estimated cost of control operations

\$900

#### Potential sources of funding

Georgetown County 50%

U.S. Army Corps of Engineers 0%

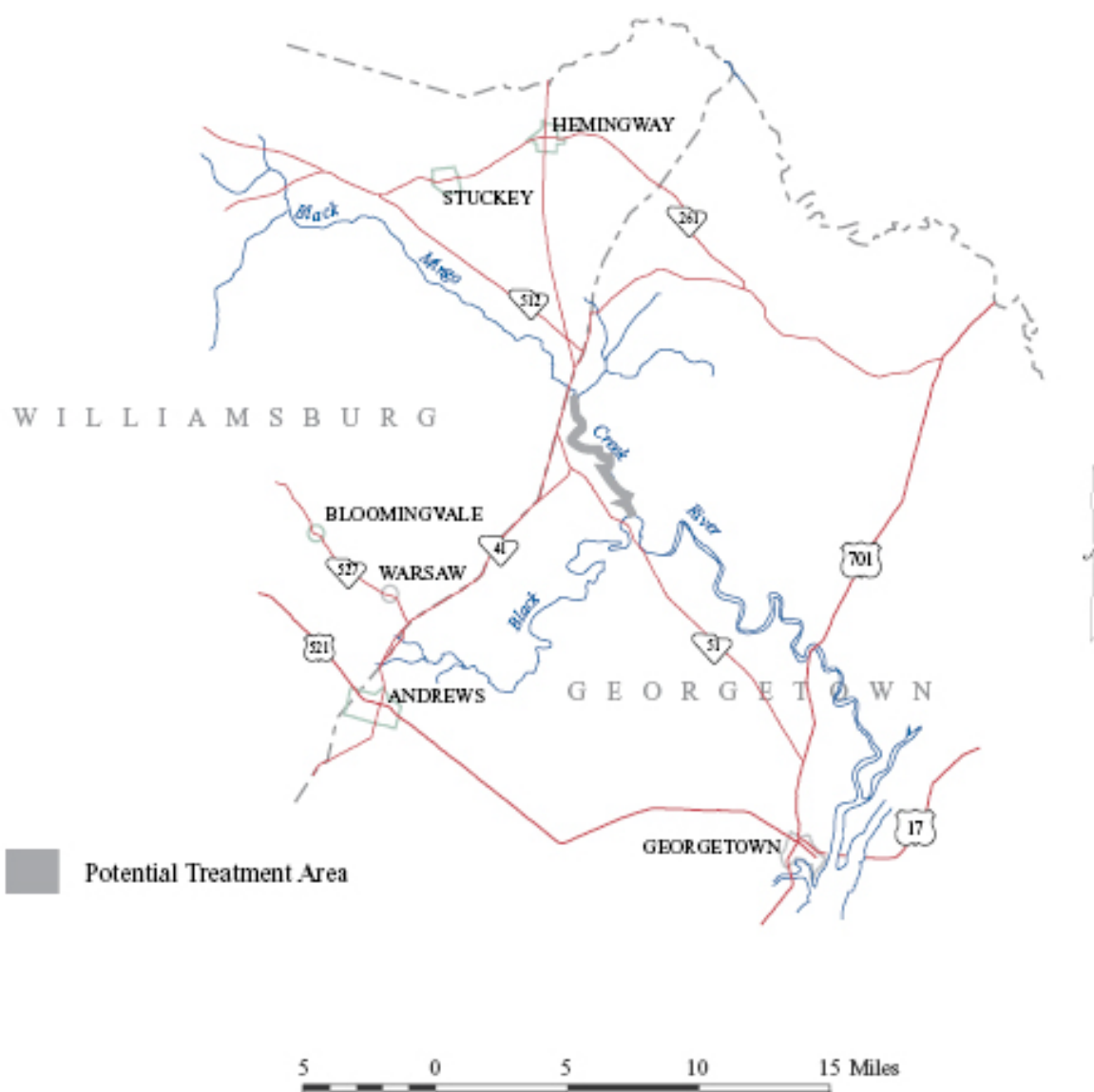
S.C. Department of Natural Resources 50% (up to \$30,000 cost share per waterbody)

(Percentage of match subject to change based on availability of Federal and State funding.)

**Long term management strategy**

- a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.
- c) Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.
- d) Continue to coordinate treatment areas with local conservation groups.

# Black Mingo Creek



#### 4. Black River (Georgetown County)

##### **Problem plant species**

Alligatorweed, Parrot feather, Frog's bit, Pennywort, Phragmites

##### **Management objective**

Reduce or remove nuisance weed infestation at public access points, the main river channel, and connecting lakes to improve water quality and navigation.

##### **Selected control method**

Problem Species	Control Agent
Alligatorweed, Pennywort	Renovate 3, Habitat, Clearcast, Glyphosate
Frog's bit, Parrot feather	Reward, Galleon SC
Phragmites	Habitat, Clearcast

##### **Area to which control is to be applied**

40 acres of problematic plants throughout river

##### **Rate of control agent to be applied**

Reward - 0.500 gallon per acre.

Renovate 3 - 0.500 to 0.750 gallons per acre.

Habitat - 0.250 - 0.750 gallons per acre.

Clearcast - 1 to 4 pints per acre.

Glyphosate - up to 0.937 gallons per acre.

Galleon SC - Floating species – 2 to 6 fl oz/acre as foliar application.

##### **Method of application of control agent**

Spray on surface of foliage with appropriate surfactant.

##### **Timing and sequence of control application**

Apply when plants are actively growing (May - Oct.).

##### **Other control application specifications**

None

##### **Entity to apply control agent**

Commercial applicator

##### **Estimated cost of control operations**

\$3,250

**Potential sources of funding**

Georgetown County 50%

U.S. Army Corps of Engineers 0%

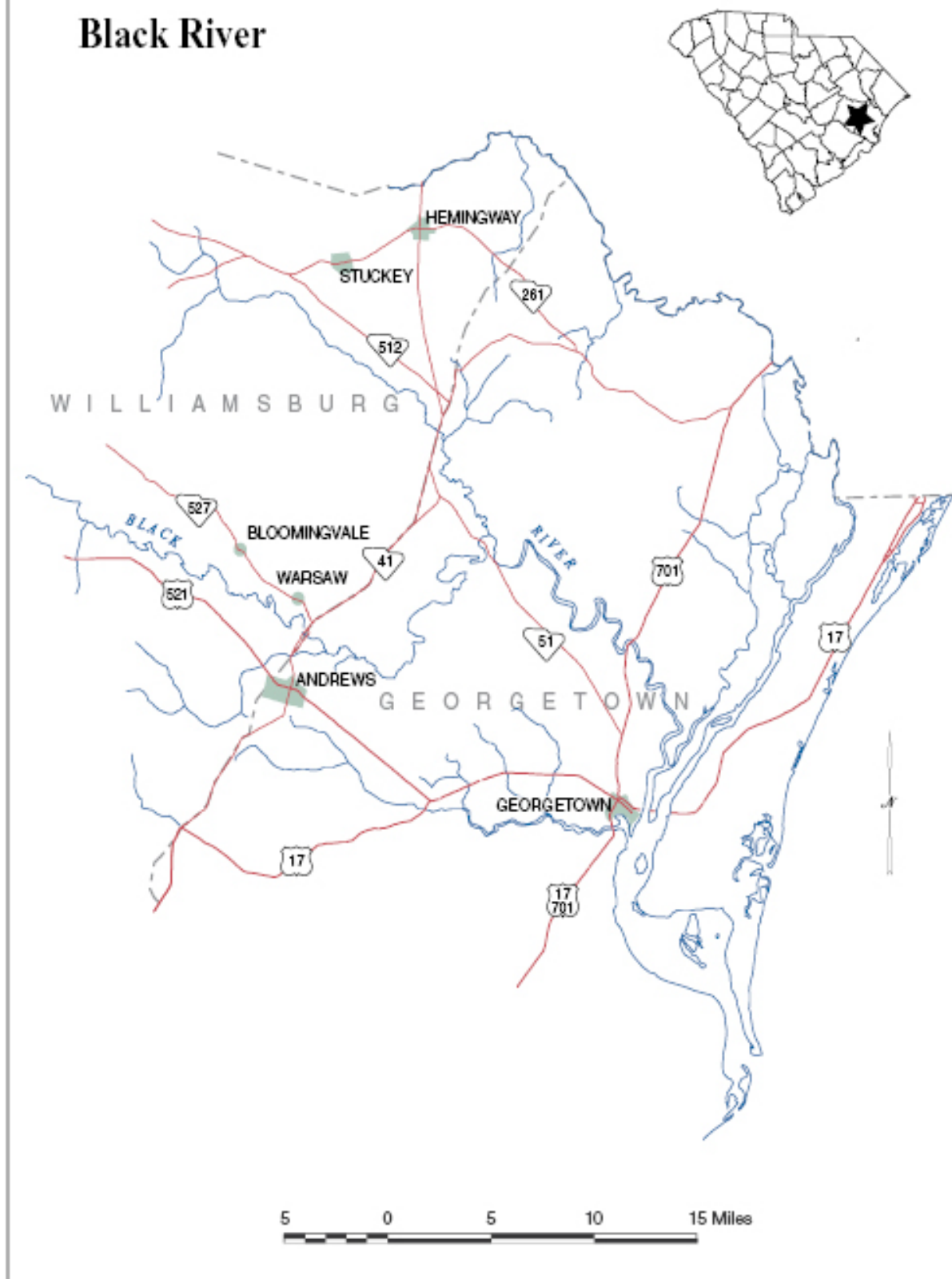
S.C. Department of Natural Resources 50% (up to \$30,000 cost share per waterbody)

(Percentage of match subject to change based on availability of Federal and State funding.)

**Long term management strategy**

- a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.
- c) Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.
- d) Continue to coordinate treatment areas with local conservation groups and State Scenic Rivers Coordinator.

## Black River



## 5. **Bonneau Ferry** **(Berkeley County)**

### **Problem plant species**

Water Primrose, Water hyacinth, Cattails, Lotus, Cutgrass, Pennywort, Frog's bit, Parrotfeather

### **Management objective**

Reduce nuisance plant populations to the greatest extent possible throughout Bonneau Ferry impoundments to enhance water quality, water flow, waterfowl habitat, fishing, and hunting opportunities.

### **Selected control method**

Problem Species	Control Agent
Water primrose, Pennywort	Renovate 3, Habitat, Clearcast, Glyphosate
Cattails, Cutgrass, Parrotfeather	Habitat, Clearcast, Glyphosate
Water hyacinth, Frog's bit	Renovate 3, Reward, Clearcast, and Galleon SC

### **Area to which control is to be applied**

40 acres of problematic plants throughout the reserves and impoundments of Bonneau Ferry.

### **Rate of control agent to be applied**

Reward - 0.500 gallon per acre.

Renovate 3 - 0.500 to 0.750 gallons per acre.

Habitat - 0.250 - 0.750 gallons per acre.

Clearcast - up to a 5% solution for spot spray.

Glyphosate - up to 0.937 gallons per acre.

Galleon SC - Floating species – 2 to 6 fl oz/acre as foliar application, submersed approximately 0.174 gallons/acre foot.

### **Method of application of control agent**

Helicopter - 20 acres of Habitat, Glyphosate, Clearcast with appropriate surfactant.

Other applications - Spray on surface of foliage with appropriate surfactant from boat.

### **Timing and sequence of control application**

Apply when plants are actively growing.

### **Other control application specifications**

None

### **Entity to apply control agent**

Commercial applicator

**Estimated cost of control operations**

\$5,750

**Potential sources of funding**

S.C. Department of Natural Resources 100%

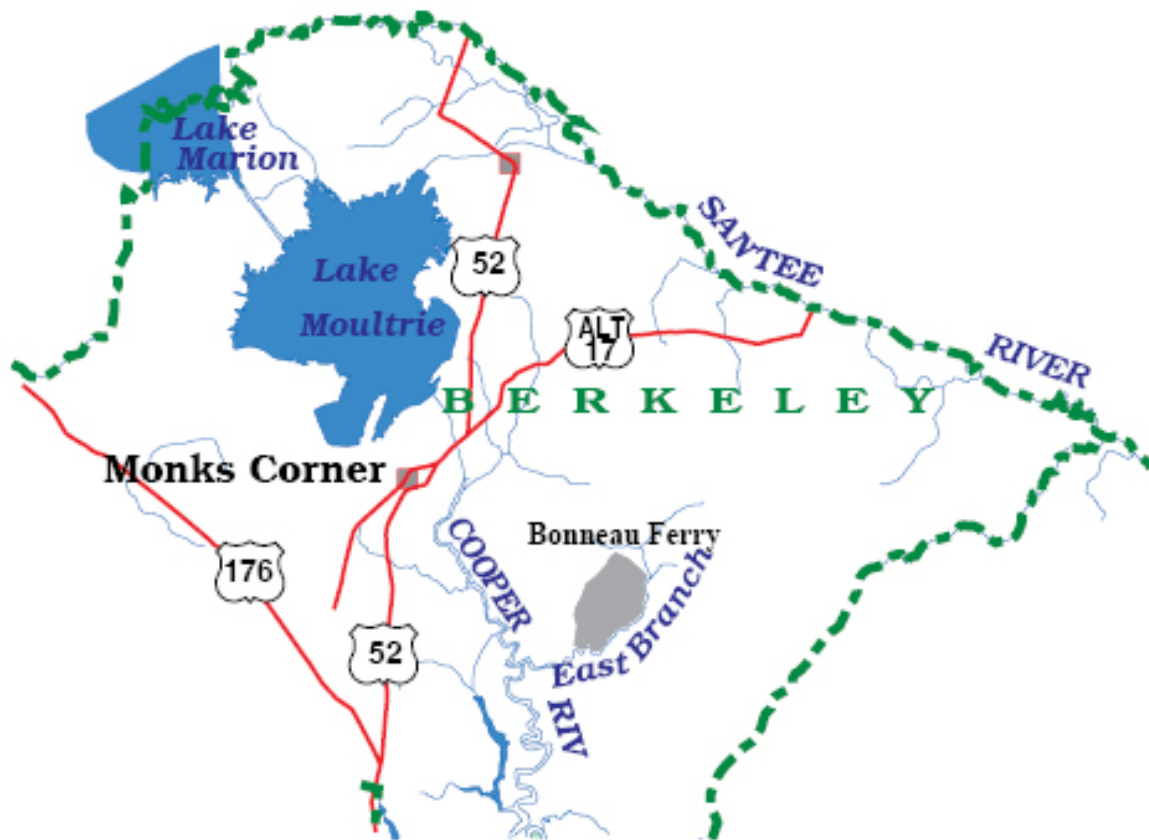
(Percentage of match subject to change based on availability of Federal and State funding.)

**Long term management strategy**

- a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.



## Bonneau Ferry



## 6. Caw Caw Interpretative Center (Charleston County)

### Problem plant species

Phragmites, milfoil, waterlily

### Management objective

Reduce or remove problem plants to the extent they do not interfere with recreational opportunities.

### Selected control method

Problem Species	Control Agent
Watermilfoil	Hardball, Renovate Max G, Clearcast
Waterlily,	Hardball, Habitat, Glyphosate, Clearcast
Phragmites	Habitat, Glyphosate, Clearcast,

### Area to which control is to be applied

5 acres

### Rate of control agent to be applied

Habitat - 2 to 3 pints per acre.

Renovate Max G – 200 lbs per acre.

Clearcast - up to 5% solution for spot spray.

Glyphosate - up to 0.937 gallons per acre. Hardball - up to 5 gallons per acre.

### Method of application of control agent

Spray on surface of foliage with appropriate surfactant and subsurface injection from airboat.  
Granular herbicides spread evenly using appropriate rate.

### Timing and sequence of control application

Apply when plants are actively growing.

### Other control application specifications

Monitor plant growth prior to treatment.

### Entity to apply control agent

Commercial applicator.

### Estimated cost of control operations

\$1,000

### Potential sources of funding

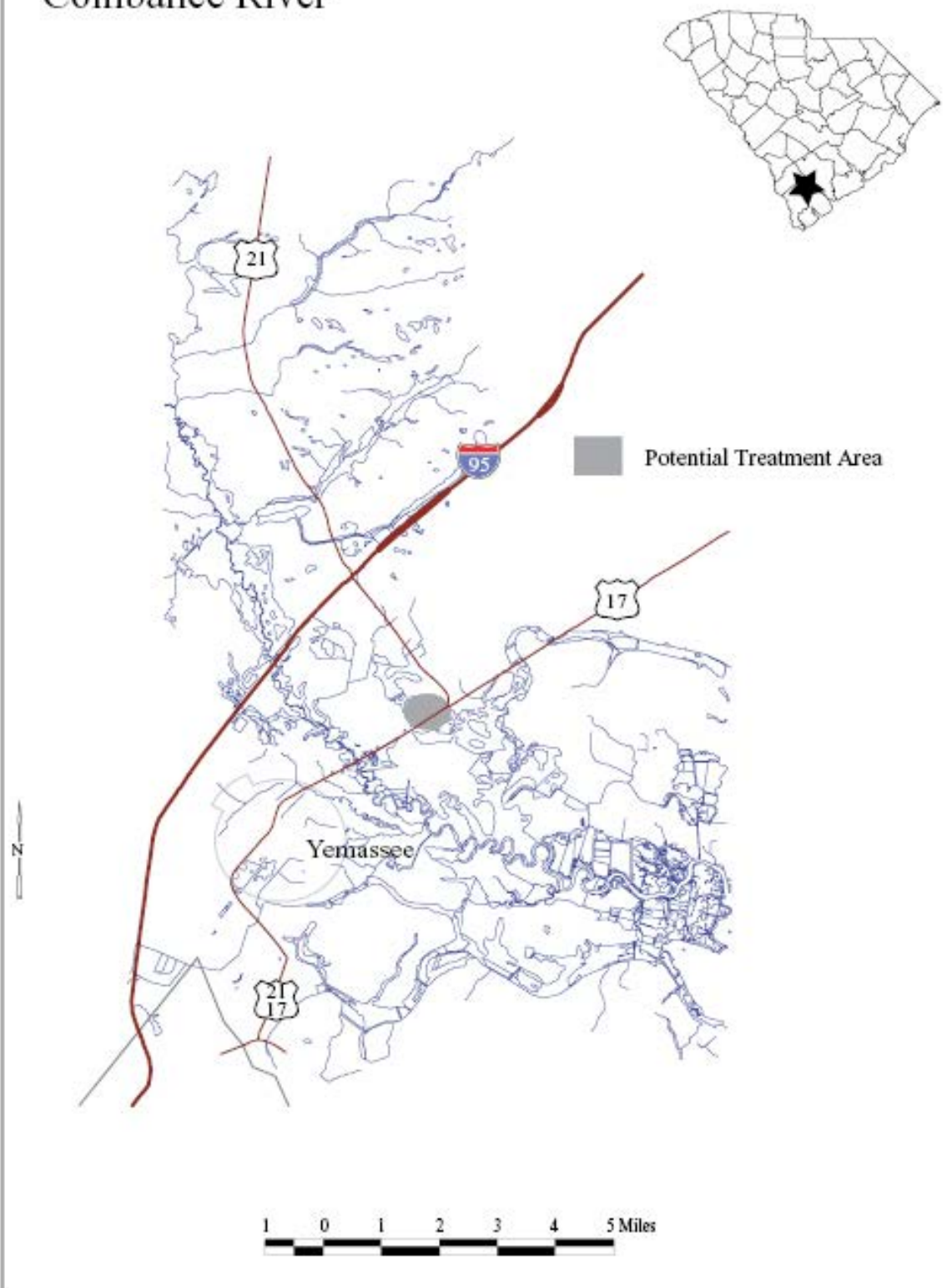
Caw Caw Interpretative Center (Charleston Co. Parks) 50%

S.C. Department of Natural Resources 50% (up to \$30,000 cost share per waterbody)  
(Percentage of match subject to change based on availability of Federal and State funding.)

**Long term management strategy**

- a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.
- c) Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.

## Combahee River



## 7. Combahee River (Borrow pit) (Colleton County)

### Problem plant species

Alligatorweed, Parrot feather, Frog's bit

### Management objective

Reduce or remove alligatorweed infestation at public access points, the main river channel, and connecting lakes.

### Selected control method

Problem Species	Control Agent
Alligatorweed	Renovate 3, Habitat, Clearcast, Glyphosate
Frog's bit, Parrot feather	Reward, Galleon SC

### Area to which control is to be applied

4 acres of problematic plants to be treated 2 times during the growing season.

### Rate of control agent to be applied

Reward - 0.500 gallon per acre.

Renovate 3 - 0.500 to 0.750 gallons per acre.

Habitat - 2 to 3 pints per acre.

Clearcast - 1 to 4 pints per acre.

Glyphosate - up to 6 pints per acre.

Galleon SC - Floating species – 2 to 6 fl oz/acre as foliar application.

### Method of application of control agent

Spray on surface of foliage with appropriate surfactant.

### Timing and sequence of control application

Apply when plants are actively growing (May - Oct.).

### Other control application specifications

None

### Entity to apply control agent

Commercial applicator

### Estimated cost of control operations

\$700

### Potential sources of funding

Colleton County 50%

U.S. Army Corps of Engineers 0%

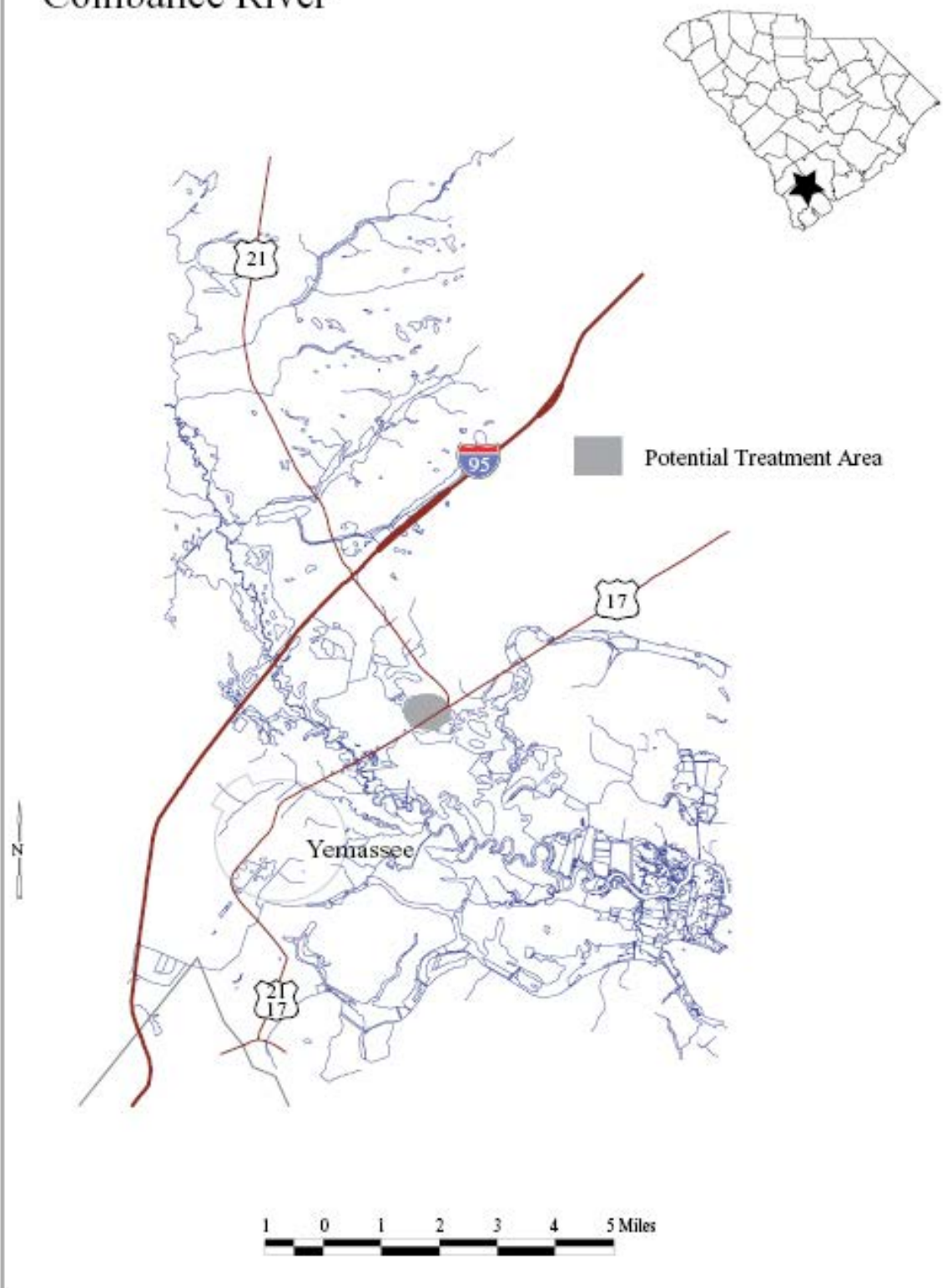
S.C. Department of Natural Resources 50% (up to \$30,000 cost share per waterbody)

(Percentage of match subject to change based on availability of Federal and State funding.)

**Long term management strategy**

- a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.
- c) Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.
- d) Continue to coordinate treatment areas with local conservation groups.

## Combahee River



## 8. Cooper River (Berkeley County)

### Problem plant species

Hydrilla, Water hyacinth, Water primrose

### Management objectives

Reduce water hyacinth populations to the greatest extent possible in the Main River and public ricefields.

Reduce water primrose growth along boat channels to maintain navigation.

Open limited boat trails in hydrilla infested ricefields to enhance public access to the river and selected ricefields.

### Selected control method

Problem Species	Control Agent
Water hyacinth	Renovate 3, Reward, Clearcast, Glyphosate, Galleon SC
Water primrose	Renovate 3, Reward, Habitat, Clearcast, Glyphosate
Hydrilla	Chelated copper*

\* May be toxic to fish at recommended treatment rates; however, precautions will be implemented to minimize the risk of fish kills.

### Area to which control is to be applied

Renovate 3, Reward, Habitat, Clearcast, Glyphosate, Galleon SC - 200 acres of water hyacinth and water primrose throughout river system and in narrow boat channels in French Quarter Creek, Rice Hope Plantation ricefield, and Berkeley Country Club ricefield.

Chelated copper - 48 acres (16 acres treated 3 times yearly, spring and fall) to open boat trails in Pimlico, Berkeley Yacht Club and Rice Hope Plantation ricefields and French Quarter Creek canal.

### Rate of control agents to be applied

Habitat - 2 to 4 pints per acre.

Reward - 2 quarts per acre.

Renovate 3 - up to 4 quarts per acre

Clearcast - 1 to 4 pints per acre.

Glyphosate - up to 0.937 gallons per acre.

Chelated copper - up to 1 ppm (about 16 gallons per acre).

Galleon SC - Floating species – 2 to 6 fl oz/acre as foliar application.

### Method of application of control agent

Renovate 3, Reward, Habitat, Galleon SC - spray on surface of foliage with appropriate surfactant.



Chelated copper - subsurface injection from airboat.

**Timing and sequence of control application**

All agents to be applied when plants are actively growing. Chelated copper treatment of boat trails to be conducted as close to low tide as possible to minimize water movement.

**Other control application specifications**

None

**Entity to apply control agent**

Commercial applicator

**Estimated cost of control operations**

\$28,000

**Potential sources of funding**

Berkeley County 50%

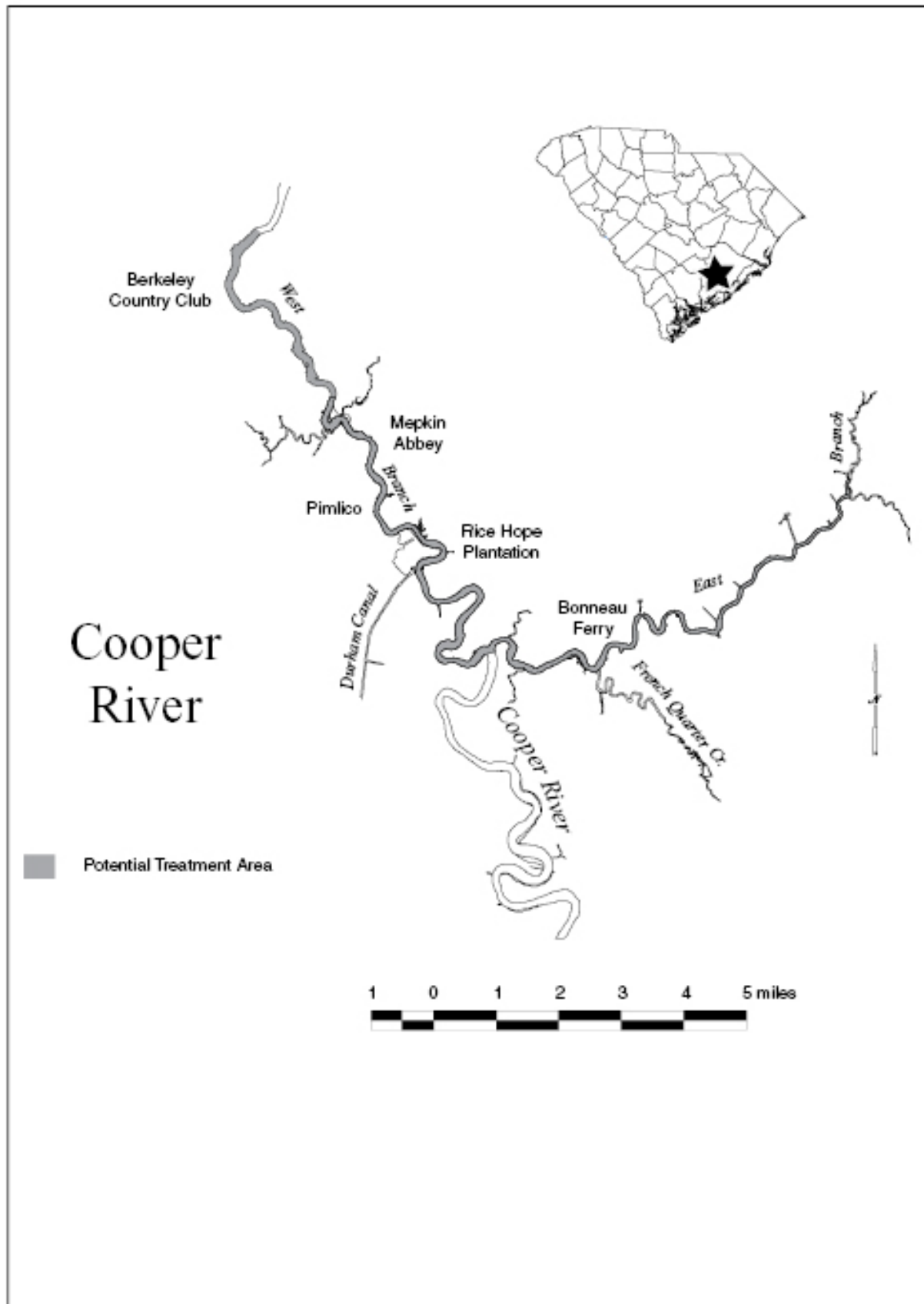
U.S. Army Corps of Engineers 0%

S.C. Department of Natural Resources 50% (up to \$30,000 cost share per waterbody)

(Percentage of match subject to change based on availability of Federal and State funding.)

**Long term management strategy**

- a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.
- c) Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.
- d) Long term management must include consideration of water hyacinth control in many privately owned ricefields to which the public does not have boat access. Water hyacinth from these ricefields can reinfest public areas.



## 9. Donnelley WMA/Bear Island WMA/ACE Basin (Colleton County)

### Problem plant species

Frog's bit, Cattails, Cutgrass, Phragmites, Swamp loosestrife

### Management objective

Reduce problem plant populations to enhance waterfowl habitat, public access and use.

### Selected control method

Problem Species	Control Agent
Frog's bit	Renovate 3, Galleon SC
Phragmites, Cattails	Habitat, Clearcast, Glyphosate
Cutgrass, Swamp loosestrife	Habitat, Clearcast, Glyphosate

### Area to which control is to be applied

40 acres of Frog's bit, Phragmites, Cattails, Cutgrass, and Swamp loosestrife throughout the area.

### Rate of control agent to be applied

Renovate 3 - 0.500 to 0.750 gallons per acre

Habitat - 2 to 3 pints per acre.

Clearcast - 1 to 4 pints per acre.

Glyphosate - up to 0.937 gallons per acre.

Galleon SC - Floating species – 2 to 12 fl oz/acre.

### Method of application of control agent

Spray on surface of foliage with appropriate surfactant.

### Timing and sequence of control application

Apply when plants are actively growing (May - Oct.).

### Other control application specifications

Application to be conducted by airboat and helicopter.

### Entity to apply control agent

Commercial applicator

### Estimated cost of control operations

\$2,900

### Potential sources of funding

Donnelley WMA/USF&W 50%

S.C. Department of Natural Resources 50% (up to \$30,000 cost share per waterbody)

(Percentage of match subject to change based on availability of Federal and State funding.)

**Long term management strategy**

- a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.

## Donnelley/Bear Island



## 10. Dungannon Plantation Heritage Preserve (Charleston County)

### Problem plant species

Frog's bit, Cattails, Bur Marigold, Cutgrass, Water Primrose, Swamp loosestrife

### Management objective

Reduce problem plant populations to enhance Wood stork nesting habitat, public access and use.

### Selected control method

Problem Species	Control Agent
Frog's bit, Water primrose, Bur marigold	Renovate 3, Habitat, Clearcast, Glyphosate, Galleon SC
Cattails	Habitat, Clearcast, Glyphosate
Cutgrass, Swamp loosestrife	Habitat, Clearcast, Glyphosate

### Area to which control is to be applied

14 acres of Frog's bit, Water primroses, and Bur marigold

14 acres of Cattails, Cutgrass, and Swamp loosestrife throughout the area.

### Rate of control agent to be applied

Renovate 3 - 0.500 to 0.750 gallons per acre.

Habitat - 2 to 3 pints per acre.

Clearcast - 1 to 4 pints per acre.

Glyphosate - up to 6 pints per acre.

Galleon SC - Floating species – 2 to 12 fl oz/acre.

### Method of application of control agent

Spray on surface of foliage with appropriate surfactant.

### Timing and sequence of control application

Apply when plants are actively growing (May - Oct.).

### Other control application specifications

Application to be conducted by airboat and Jon-boat.

### Entity to apply control agent

Commercial applicator

### Estimated cost of control operations

\$2,000

### Potential sources of funding

Donnelley WMA/USF&W 50%

S.C. Department of Natural Resources 50% (up to \$30,000 cost share per waterbody)

(Percentage of match subject to change based on availability of Federal and State funding.)

**Long term management strategy**

- a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.
- c) Enhance aquatic plant communities to benefit waterfowl and to increase nesting activities of Wood storks and other waterfowl.

## Dungannon Plantation HP





## 11. Goose Creek Reservoir (Berkeley County)

### Problem plant species

Hygrophila, Water hyacinth, Water primrose, Water lettuce, Hydrilla, Watermilfoil, Fanwort, Salvinia minima, Duckweed

### Management objective

Reduce water hyacinth and water lettuce populations to the greatest extent possible throughout the lake.

Reduce water primrose, water lettuce and water hyacinth in the upper portion of the lake to enhance water flow and public access.

Reduce hydrilla growth throughout the lake to minimize its spread within the lake, help prevent its spread to adjacent public waters, and minimize adverse impacts to public use and access.

Reduce duckweed growth throughout populated portions of the lake to minimize adverse impacts to public use and access.

Reduce filamentous algae growth throughout populated portions of the lake to minimize adverse impacts to public use and access.

Maintain diverse aquatic plant community through selective application of control methods.

### Selected control method

Problem Species	Control Agent
Water primrose, Hygrophila	Renovate 3, MaxG, Habitat, Clearcast, Glyphosate
Water hyacinth, Water lettuce	Renovate 3, Reward, Galleon SC, Clipper
Watermilfoil, fanwort	Reward, Hardball, Clearcast
Hydrilla, Hygrophila	Aquathol K, chelated copper, triploid grass carp
Duckweed	Sonar, Reward, Galleon SC, Clipper
Filamentous Algae	Captain

### Area to which control is to be applied

Renovate 3, Habitat, Clearcast, Glyphosate- 100 acres water primrose in upper reservoir and boat ramp.

Reward - 50 acres of water hyacinth and water lettuce throughout reservoir.

Renovate 3, Reward, Galleon SC - 100 acres of water hyacinth and water lettuce throughout the reservoir.

Reward, Hardball, Galleon SC - 20 acres of submersed growth throughout the reservoir.

Renovate 3, Habitat, Clearcast, Glyphosate, Aquathol – up to 30 acres of Hygrophila throughout the reservoir.

Release triploid grass carp in areas of the lake with greatest hydrilla growth. Grass carp will be released in selected areas, such as boat ramps and park sites, around the reservoir to achieve as even a distribution as practicable.

Sonar, Reward, Galleon SC – 50 acres of duckweed near populated areas of the reservoir.

Captain – 50 acres of filamentous algae near populated areas of the reservoir.

#### **Rate of control agents to be applied**

Reward - 0.500 gallon per acre.

Renovate 3 - 0.500 to 0.750 gallons per acre.

Habitat - up to 4 pints per acre.

Clearcast - 1 to 4 pints per acre.

Glyphosate - up to 6 pints per acre.

Hardball - up to 5 gallons per acre.

Clipper – up to 0.09375 gallons per acre

Galleon SC - Submersed 0.174 fl oz/acre foot to achieve minimum effective concentration of 25 to 75 ppb Floating species – 2 to 6 fl oz/acre as foliar application.

\*Triploid Grass Carp - 825 fish in the entire reservoir.

\*Based on a 32%(825) mortality to maintain existing population.

#### **Method of application of control agents**

Renovate 3, Habitat, Glyphosate, Reward, Clipper, Galleon SC - spray on surface of foliage with appropriate surfactant.

Reward, Hardball, Galleon SC - subsurface injection from airboat.

Triploid grass carp – Using standard techniques to minimize loss, stock sterile grass carp in areas of the lake with the greatest hydrilla growth.

#### **Timing and sequence of control application**

All agents to be applied when plants are actively growing.

Triploid grass carp to be released as soon as possible in the spring of 2013 (March-May).

RESULTS FROM GRASS CARP MAY NOT BE EVIDENT FOR TWO OR MORE YEARS.

#### **Other control application specifications**

Treatment of the control area is to be conducted in a manner that will not significantly degrade water quality. This may require that only a portion of the control area be treated at any one time. Coordinate all control operations with Charleston Commissioners of Public Works and Goose Creek Reservoir Watershed Task Force.

If available, all sterile grass carp will be a minimum of 12 inches in length. Sterile grass carp shipments for Goose Creek Reservoir will be certified by the SCDNR for sterility and checked for size and condition prior to stocking in the lake.

Hydrilla is slowly increasing in acreage along with other submerged species. Hydrilla populations will be carefully monitored and in the event that significant regrowth occurs during the year the Aquatic Plant Management Council may consider the need for additional grass carp or treat with herbicides to give short-term control as needed.

**Entity to apply control agents**

Herbicides - Commercial Applicator

Triploid Grass Carp - S.C. Public Service Authority and/or a commercial supplier with supervision by the SCDNR.

**Estimated cost of control operations**

\$34,500

**Potential sources of funding**

Charleston Commissioner of Public Works 50%

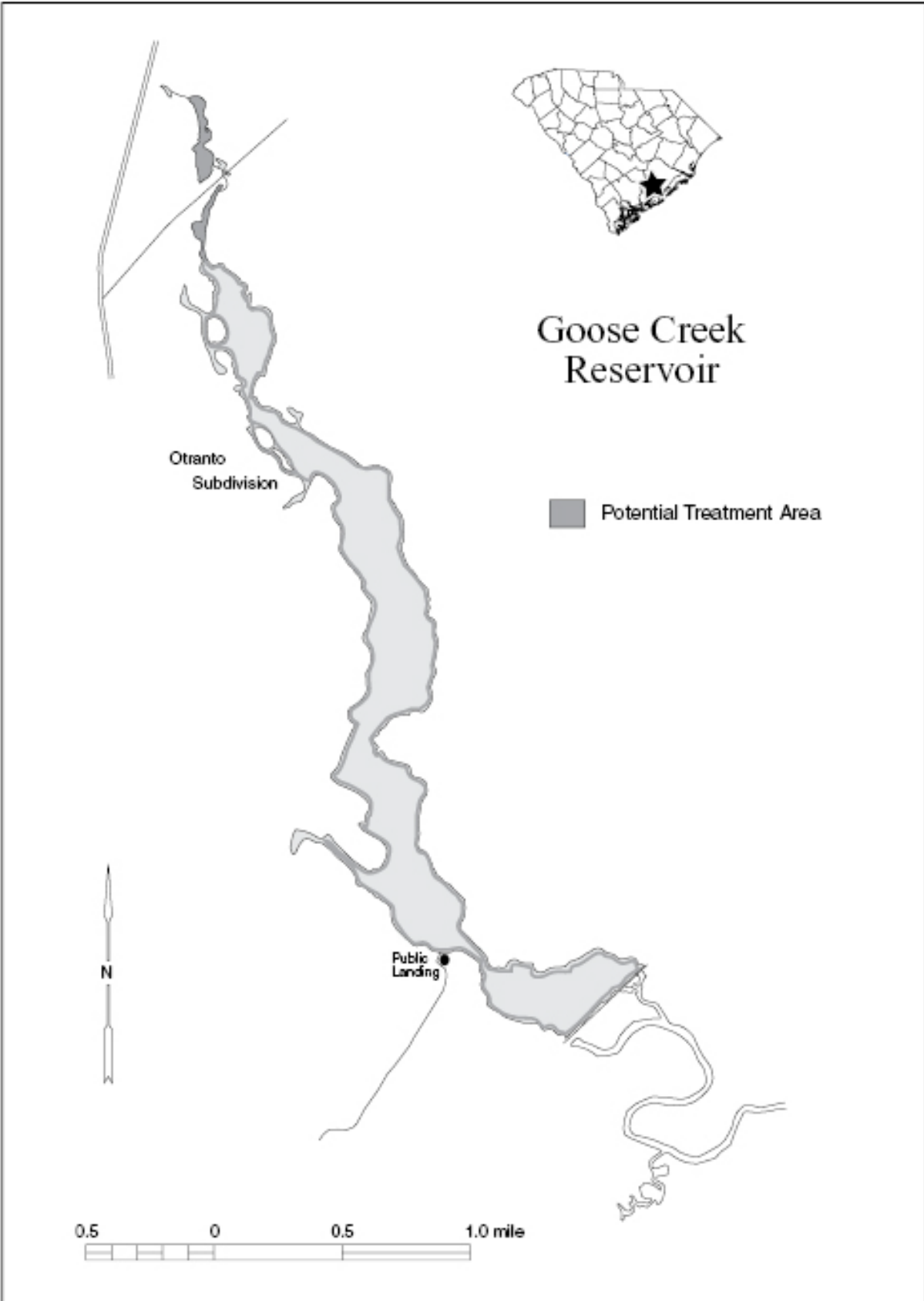
U.S. Army Corps of Engineers 0%

S.C. Department of Natural Resources 50% (up to \$30,000 cost share per waterbody)

(Percentage of match subject to change based on availability of Federal and State funding.)

**Long term management strategy**

- a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.
- c) Seek to prevent further introduction and distribution of problem species



## 12. Lake Bowen (Spartanburg County)

### **Problem plant species**

Chara

### **Management objective**

Reduce or remove problem plants to the extent they do not interfere with recreational opportunities.

### **Selected control method**

Triploid grass carp

Chelated copper

### **Area to which control is to be applied**

40 acres in lake.

### **Rate of control agent to be applied**

Approximately 40 acres in priority areas such as, public access sites (boat ramps, piers, swimming areas, marinas) and residential shoreline areas. If conditions warrant, release triploid grass carp in close proximity to areas of the lake with the greatest chara growth and use herbicide applications to provide immediate short-term control of localized growth in those areas. Since infestation is limited, stock 5 triploid carp per vegetated acre (200 triploid carp). This also equals about 1 fish per 8 surface acres which is considered maintenance stocking.

Chelated copper - up to 1 ppm

### **Method of application of control agents**

Chelated copper- subsurface application by airboat.

Triploid grass carp – Using standard techniques to minimize loss, stock sterile grass carp in areas of the lake with the greatest chara growth.

### **Timing and sequence of control application**

Herbicide - Apply when plants are actively growing.

Triploid grass carp to be released as soon as possible in the spring of 2013 (March-May).

RESULTS FROM GRASS CARP MAY NOT BE EVIDENT FOR TWO OR MORE YEARS.

Other control application specifications

If available, all sterile grass carp will be a minimum of 12 inches in length. Sterile grass carp shipments for Lake Bowen will be certified by the SCDNR for sterility and checked for size and condition prior to stocking in the lake and additional incremental stockings may be necessary based on the possibility of escape via the outflow at the dam

### **Entity to apply control agent**

Commercial applicator

**Estimated cost of control operations**

\$1,600

**Potential sources of funding**

Spartanburg CPW 50%

S.C. Department of Natural Resources 50% (up to \$30,000 cost share per waterbody)

(Percentage of match subject to change based on availability of Federal and State funding.)

**Long term management strategy**

- a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.
- c) A long-term integrated management strategy has been implemented to control submersed nuisance species. Triploid grass carp have been stocked to control submersed nuisance species growth lake-wide and approved aquatic herbicides are used to control localized growth in priority use areas. Future plans include annual maintenance stocking of grass carp to maintain the population at a level that is sufficient to maintain control of submersed nuisance species but to minimize impacts on desirable native plant populations.
- d) Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.
- e) Periodically revise the management strategy and specific control sites as new environmental data, management agents and techniques, and public use patterns become available.

### **13. Lake Cunningham (Greenville County)**

**Problem plant species**

Brazilian elodea, Fragrant water-lily, Water primrose, Spatterdock

**Management objective**

Reduce nuisance plant populations to the greatest extent possible throughout lake to enhance water quality, water flow, waterfowl habitat, fishing, and hunting opportunities.

**Selected control method**

<u>Problem Species</u>	<u>Control Agent</u>
Brazilian elodea	Chelated copper, triploid grass carp
Water primrose,	Renovate 3, Habitat, Clearcast,
Fragrant waterlily, spatterdock	Renovate 3, Habitat, Clearcast,

#### **Area to which control is to be applied**

8 acres of problematic plants throughout Lake Cunningham.

#### **Rate of control agent to be applied**

Renovate 3 - 0.500 to 0.750 gallons per acre.

Habitat - 2 to 3 pints per acre.

Clearcast - 1 to 4 pints per acre.

Chelated copper – up to 1 ppm.

Triploid grass carp – Stock to maintain 1 fish per 8 surface acre density when population levels dictate.

#### **Method of application of control agent**

Herbicides spray on surface of foliage with appropriate surfactant from boat or subsurface injection from airboat.

Triploid grass carp – Using standard techniques to minimize loss, stock sterile grass carp in areas of the lake with the greatest Brazilian elodea growth.

#### **Timing and sequence of control application**

Herbicide - Apply when plants are actively growing.

Triploid grass carp to be released as soon as possible in the spring of 2013 (March-May).

RESULTS FROM GRASS CARP MAY NOT BE EVIDENT FOR TWO OR MORE YEARS.

Other control application specifications

If available, all sterile grass carp will be a minimum of 12 inches in length. Sterile grass carp shipments for Lake Cunningham will be certified by the SCDNR for sterility and checked for size and condition prior to stocking in the lake and additional incremental stockings may be necessary based on the possibility of escape via the outflow at the dam

#### **Entity to apply control agent**

Commercial applicator

#### **Estimated cost of control operations**

\$2,000

#### **Potential sources of funding**

Greer CPW 50%

S.C. Department of Natural Resources 50% (up to \$30,000 cost share per waterbody)

(Percentage of match subject to change based on availability of Federal and State funding.)

#### **Long term management strategy**

- a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.
- c) A long-term integrated management strategy has been implemented to control Brazilian elodea. Triploid grass carp have been stocked to control Brazilian elodea growth lake-wide and approved aquatic herbicides are used to control localized growth in priority use areas. Future plans include annual maintenance stocking of grass carp to maintain the population at a level that is sufficient to maintain control of Brazilian elodea but to minimize impacts on desirable native plant populations.
- d) Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.
- e) Periodically revise the management strategy and specific control sites as new environmental data, management agents and techniques, and public use patterns become available.



# Lake Cunningham



## 14. Lake Greenwood (Greenwood and Laurens County)

### Problem plant species

Slender naiad, Hydrilla, Water primrose

### Management objectives

Maintain reduced hydrilla growth throughout the lake to minimize its spread within the lake, help prevent its spread to adjacent public waters, and minimize adverse impacts to drinking water withdrawals and public use and access.

Monitor water primrose growth and consider control options if impacts are greater than anticipated.

Maintain diverse aquatic plant community through selective application of control methods and introduction of desirable native plant species.

### Selected control method

Triploid grass carp stocked in previous years have substantially reduced hydrilla coverage in Lake Greenwood through 2012. Consequently, no additional grass carp stockings are planned for these areas in 2013. However, hydrilla regrowth will be carefully monitored and in the event that survey results and regrowth warrant, the Aquatic Plant Management Council may reconsider the need for additional grass carp.

Aquatic herbicides - selected areas of water primrose infestation to provide public access.

### Problem Species

Slender naiad, Hydrilla

Water primrose

### Control Agent

Aquathol K, Sonar, Triploid Grass Carp, chelated copper\*

Renovate 3, Glyphosate, Habitat, Clearcast

### Area to which control is to be applied

If needed, release triploid grass carp in areas of the lake with greatest hydrilla growth.

Use aquatic herbicides to provide control at high priority public access points, such as boat ramps and park sites

### Rate of control agents to be applied

Aquathol K - 0.500 to 4 ppm (about 3 to 8 gallons per acre depending on depth)

Habitat – 0.250 – 0.750 gallons per acre

Clearcast - -up to 5% spot spray

Sonar - 0.075 to 0.250 ppm

Chelated Copper- up to 1 ppm

Sonar Q, Sonar PR - up to .40 ppm (approx 10 pounds/acre)

Triploid Grass Carp – Stock to maintain 1 to 10 surface acres density when population dictates.

**Method of application of control agents**

Aquathol K, Sonar, chelated copper\* - Subsurface application by airboat with adjuvant.

Renovate 3, Glyphosate, Habitat, Clearcast - spray on surface of foliage with appropriate surfactant.

Triploid grass carp – Using standard techniques to minimize loss, stock sterile grass carp in areas of the lake with the greatest hydrilla growth.

**Timing and sequence of control application**

Agent to be applied when plants are actively growing.

Agent to be applied to hydrilla when plants are actively growing but prior to tuber production.

Triploid grass carp to be released as soon as possible in the spring of 2013 (March-May).

**Other control application specifications**

Herbicide used only upon approval by the S.C. Department of Health and Environmental Control.

Treatment of control area is to be conducted in a manner that will not significantly degrade water quality. Survey and final determination of treatment areas to be conducted in conjunction with the South Carolina Department of Natural Resources district fisheries biologist. In general, treatment will be limited to developed shoreline areas, public access sites, and areas of high public use.

Hydrilla may require multiple treatments.

**Entity to apply control system**

Commercial applicator

**Estimated cost of control operations**

\$6,000

**Potential sources of funding**

Greenwood County 50%

U.S. Army Corps of Engineers 0%

S.C. Department of Natural Resources 50% (up to \$30,000 cost share per waterbody)

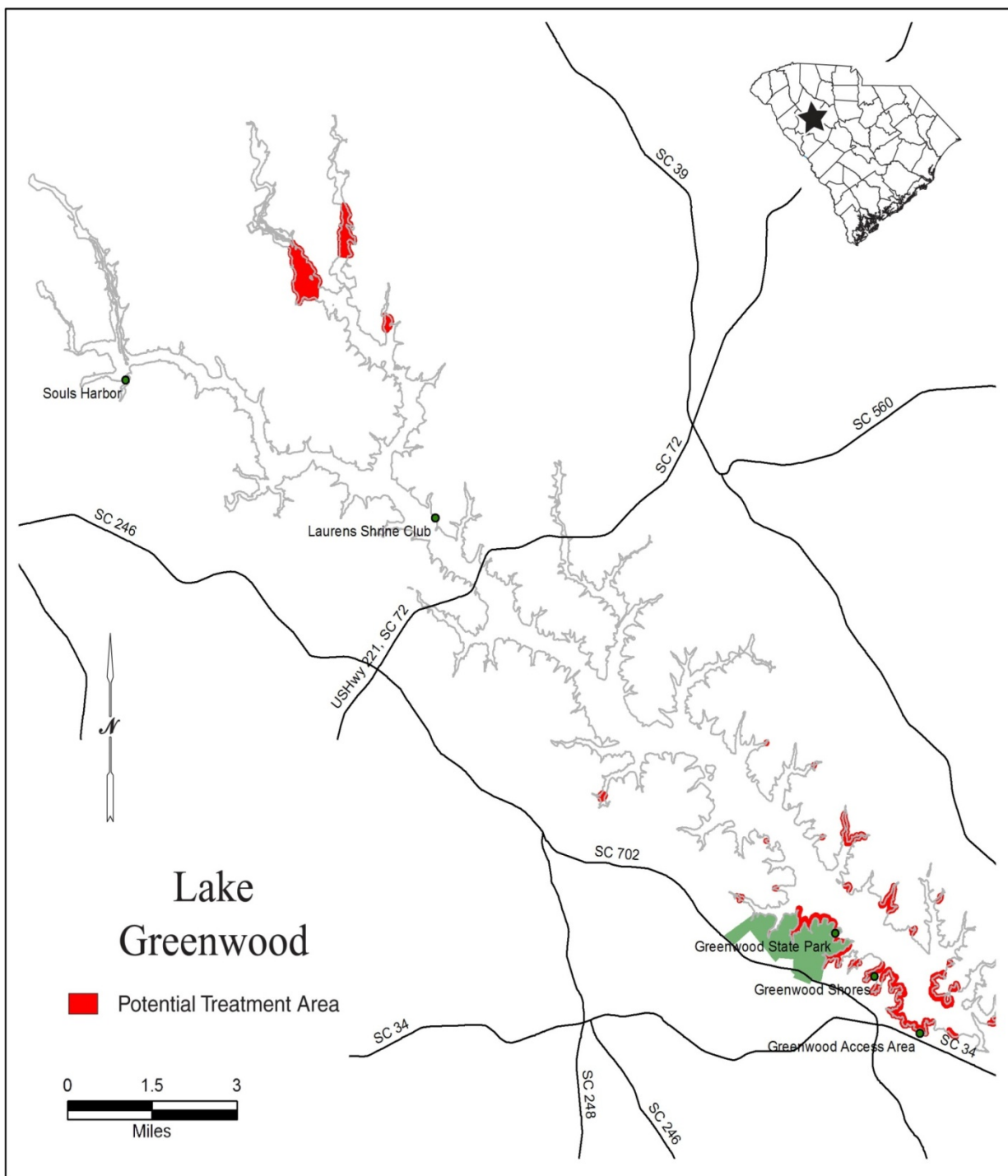
(Percentage of match subject to change based on availability of Federal and State funding.)

**Long term management strategy**

- a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant

populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.

- c) Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.



## 15. Lake Keowee (Pickens and Oconee County)

### **Problem plant species**

Hydrilla

### **Management objectives**

Keep hydrilla growth suppressed to minimize its spread within the lake, help prevent its spread to adjacent public waters and minimize adverse impacts to water use activities.

### **Selected control method**

Chelated copper \*

Fall/winter water level drawdown

\* May be toxic to fish at recommended treatment rates; however, precautions will be implemented to minimize the risk of fish kills.

### **Area to which control is to be applied**

Chelated copper - 5 acres

Drawdown - entire lake

### **Rate of control agent to be applied**

Chelated copper - up to 1 ppm (about 16 gallons per acre)

Drawdown - to the greatest extent possible within project limits.

### **Method of application of control agent**

Chelated copper - subsurface injection by airboat with adjuvant.

Drawdown - draw lake down.

### **Timing and sequence of control application**

Herbicide application - when plants are actively growing.

Drawdown - Drawdown Lake from October through February.

### **Other control application specifications**

Herbicide application - Herbicide used only upon notification of all local potable water supply authorities and approval by S.C. Department of Health and Environmental Control. Treatment of control area will be conducted in a manner that will not significantly degrade water quality.

Drawdown - Extent and duration of drawdown is dependent on operational limits of hydroelectric project, Federal regulations, electric demand, precipitation, and inflow.

### **Entity to apply control system**

Herbicide application - Commercial applicator or Duke Power Company

Drawdown - Duke Power Company

**Estimated cost of control operations**

Herbicide application - \$0.00 (Hydrilla has not been observed in several years on Lake Keowee, therefore no applications are needed at this time.)

Drawdown - Undetermined

**Potential sources of funding**

Duke Power Company 50%

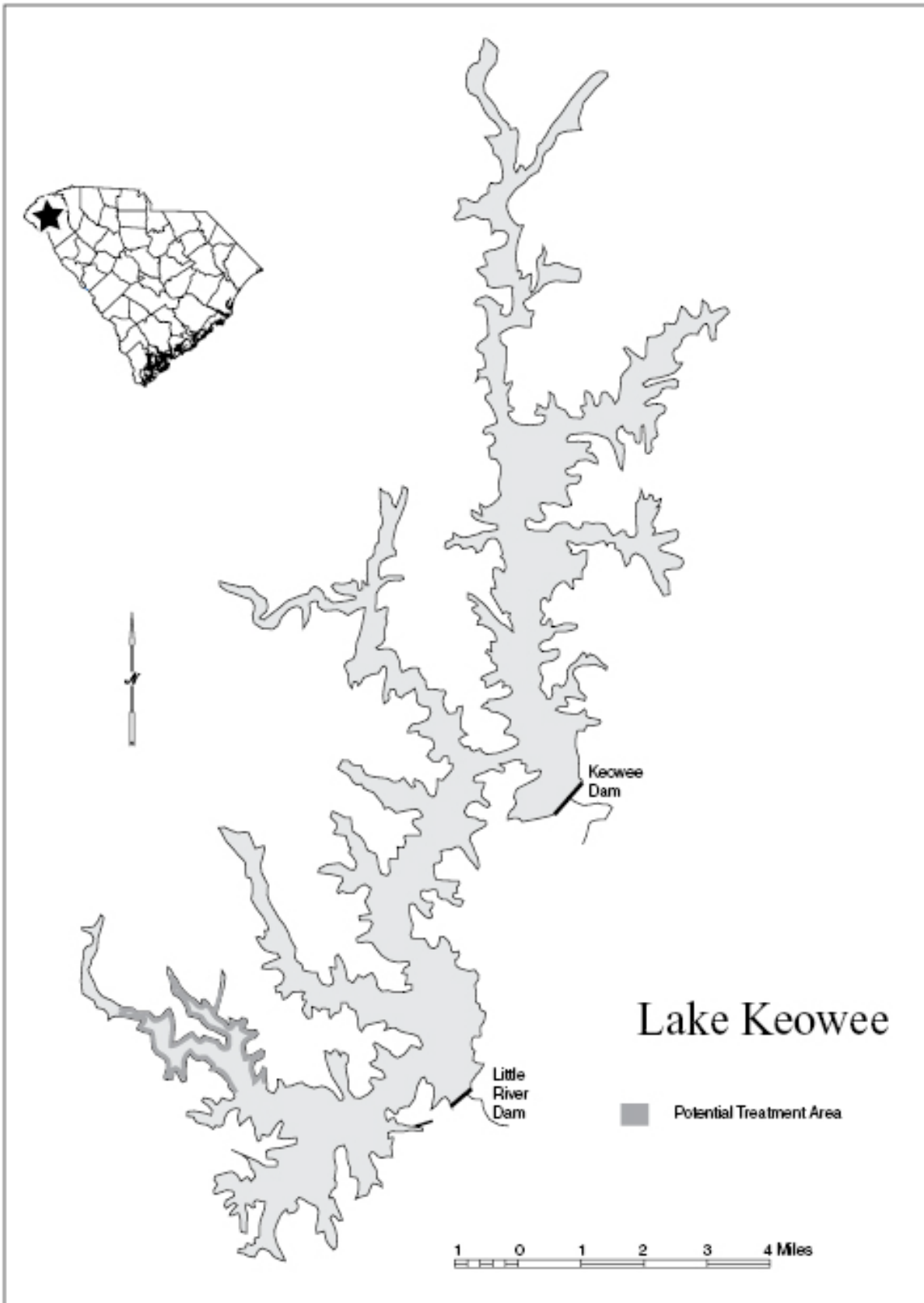
U.S. Army Corps of Engineers 0%

S.C. Department of Natural Resources 50% (up to \$30,000 cost share per waterbody)

(Percentage of match subject to change based on availability of Federal and State funding.)

**Long term management strategy**

- a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.
- c) Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.





## 16. Lake Monticello (Recreation Lake) (Fairfield County)

### Problem plant species

Hydrilla

### Management objectives

Manage hydrilla growth throughout the Recreation Lake section to minimize its spread to Lake Monticello, help prevent its spread to adjacent public waters, and minimize adverse impacts to agricultural irrigation withdrawals, and public use and access.

### Selected control method

#### Problem Species

Hydrilla

#### Control Agent

Aquathol K, Sonar, Triploid Grass Carp,  
chelated copper\*

### Area to which control is to be applied

Hydrilla - Approximately 25 acres in "Recreation Lake" site. Use herbicide applications to provide immediate short-term control of localized growth in approximately 25 acres of hydrilla infestation in Recreation Lake. Stock Triploid Grass Carp to provide long term control option.

### Rate of control agents to be applied

Aquathol K - 0.500 to 4 ppm (about 3 to 8 gallons per acre depending on depth)

Sonar - 0.075 to 0.250 ppm

Chelated Copper- up to 1 ppm

Sonar Q, Sonar PR - up to .40 ppm (approx 10 pounds/acre)

Triploid Grass Carp – 25 fish per vegetated acre (625)

### Method of application of control agents

Aquathol K, Sonar, chelated copper\* - Subsurface application by airboat with adjuvant.

Triploid grass carp – Using standard techniques to minimize loss, stock sterile grass carp in areas of the lake with the greatest hydrilla growth.

### Timing and sequence of control application

Agent to be applied to hydrilla when plants are actively growing but prior to tuber production.

Triploid grass carp to be released as soon as possible in the spring of 2013 (March-May).

RESULTS FROM GRASS CARP MAY NOT BE EVIDENT FOR TWO OR MORE YEARS.

### Other control application specifications

Herbicide used only upon approval by the S.C. Department of Health and Environmental Control.

Treatment of control area is to be conducted in a manner that will not significantly degrade water quality. Survey and final determination of treatment areas to be conducted in conjunction with the South Carolina Department of Natural Resources district fisheries biologist.

In general, treatment will be limited to developed shoreline areas, public access sites, and areas of high public use.

Hydrilla may require multiple treatments.

**Entity to apply control system**

Commercial applicator

**Estimated cost of control operations**

\$6,000

**Potential sources of funding**

Triploid grass carp

S.C. Electric and Gas Company, Lexington and Richland Counties 50%

U.S. Army Corps of Engineers 0%

S.C. Department of Natural Resources 50% (up to \$30,000 cost share per waterbody)

Mechanical harvester, S.C. Electric and Gas Company, Commercial marina operators, and residential property owners.

Aquatic herbicides

S.C. Electric and Gas Company, Lexington and Richland Counties 50%

U.S. Army Corps of Engineers 0%

S.C. Department of Natural Resources 50% (up to \$30,000 cost share per waterbody)

(Percentage of match subject to change based on availability of Federal and State funding.)

**Long term management strategy**

- a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.
- c) Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.

## 17. Lake Murray (Lexington, Newberry, Richland and Saluda Counties)

### Problem plant species

Hydrilla, Illinois pondweed, Water Primrose

### Management objectives

Maintain reduced hydrilla and Illinois pondweed growth throughout the lake to minimize its spread within the lake, help prevent its spread to adjacent public waters, and minimize adverse impacts to drinking water withdrawals and public use and access.

Monitor water primrose growth and consider control options if impacts are greater than anticipated.

Maintain diverse aquatic plant community through selective application of control methods and introduction of desirable native plant species.

### Selected control method

Triploid grass carp stocked in 2003 substantially reduced hydrilla coverage in Lake Murray during 2003-2012. Consequently, no additional grass carp stockings are planned for these areas in 2013. However, hydrilla populations and potential regrowth will be carefully monitored and in the event that survey results and regrowth warrant, the Aquatic Plant Management Council may reconsider the need for additional grass carp.

Mechanical harvester – short-term control in selected areas to provide public access and clear areas around municipal water intakes.

Aquatic herbicides - short-term control in selected areas to provide public access and clear areas around municipal water intakes.

Problem Species	Control Agents
Hydrilla	Chelated copper (Nautique)
Water primrose	Renovate 3, Habitat, Clearcast

### Area to which control is to be applied

If needed, release triploid grass carp in areas of the lake with greatest hydrilla growth.

Use mechanical harvesters or aquatic herbicides to provide immediate short-term control at high priority public access points, such as boat ramps and park sites, and municipal water intakes (75 acres of water primrose).

### Rate of control agent to be applied

If hydrilla acreage in 2013 warrants, additional grass carp may be stocked to maintain a density of 1 per 10 surface acres following Council approval. Maintenance stocking should begin in 2013 to reduce the possibility of a rebound in hydrilla acreage.

Harvest acreage as needed to provide public use, access and clear areas around municipal water intakes.

Apply aquatic herbicides to provide immediate short-term control at high priority public access points and municipal water intakes.

Chelated copper - up to 1 ppm  
Renovate 3 - 0.500 to 0.750 gallons per acre.  
Habitat - 2 to 4 pints per acre.  
Clearcast - 1 to 4 pints per acre.

#### **Method of application of control agent**

Triploid grass carp - See section 3 above.

Use mechanical harvester as designed.

All agents to be applied when plants are actively growing.

#### **Timing and sequence of control application**

If hydrilla acreage in 2013 warrants, additional grass carp may be stocked following Council approval.

Harvest aquatic growth as it becomes problematic; multiple applications are likely.

Apply herbicides to aquatic vegetation as it becomes problematic.

#### **Other control application specifications**

If needed, all sterile grass carp will be a minimum of 12 inches in length. All sterile grass carp shipments for Lake Murray will be examined by the SCDNR for sterility, size, and condition at the Campbell Fish Hatchery in Columbia prior to stocking in the lake.

Harvested vegetation must be removed from the lake and deposited on high ground. The harvesting process must minimize adverse impacts to fish.

Control by Residential/Commercial Interests:

This plan is designed to provide relief from noxious aquatic vegetation for the public at large. Private entities such as lake-front residents and commercial interests may have site specific concerns not addressed immediately by the use of grass carp or mechanical harvesters at public access areas. Residential and commercial interests may remove nuisance aquatic vegetation manually or by use of mechanical harvesting devices. Of the three major control methods the following conditions apply.

1) Mechanical harvesters – Commercial aquatic plant harvesting services may be hired to remove hydrilla and Illinois pondweed from areas adjacent to residential and commercial property after notification of SCE&G. Harvesting precautions as stated in item above must be adhered to.

2) Aquatic herbicides – SCE&G opposes regular or general application of herbicides in Lake Murray, therefore, aquatic herbicides may not be applied in the lake by lake front property owners.

3) Sterile grass carp - A sufficient number of grass carp have been stocked by SCDNR to control nuisance aquatic vegetation. Stocking additional grass carp in Lake Murray without written consent by the SCDNR is prohibited.

#### **Entity to apply control agent**

Triploid grass carp - Commercial supplier with supervision by the SCDNR.

Mechanical harvester – Commercial harvester under supervision of SCE&G at park sites and public boat ramps; private marina operators to contract for application at commercial boat ramps.

Aquatic herbicides - Commercial applicator under supervision by the SCDNR.

**Estimated cost of control operations**

Triploid grass carp - None anticipated

Mechanical harvester - \$500-1000/acre

Aquatic herbicides - \$0

**Potential sources of funding**

Triploid grass carp if needed.

S.C. Electric and Gas Company, Lexington and Richland Counties 50%

U.S. Army Corps of Engineers 0%

S.C. Department of Natural Resources 50% (up to \$30,000 cost share per waterbody)

Mechanical harvester, S.C. Electric and Gas Company, Commercial marina operators, and residential property owners.

Aquatic herbicides

S.C. Electric and Gas Company, Lexington and Richland Counties 50%

U.S. Army Corps of Engineers 0%

S.C. Department of Natural Resources 50% (up to \$30,000 cost share per waterbody)

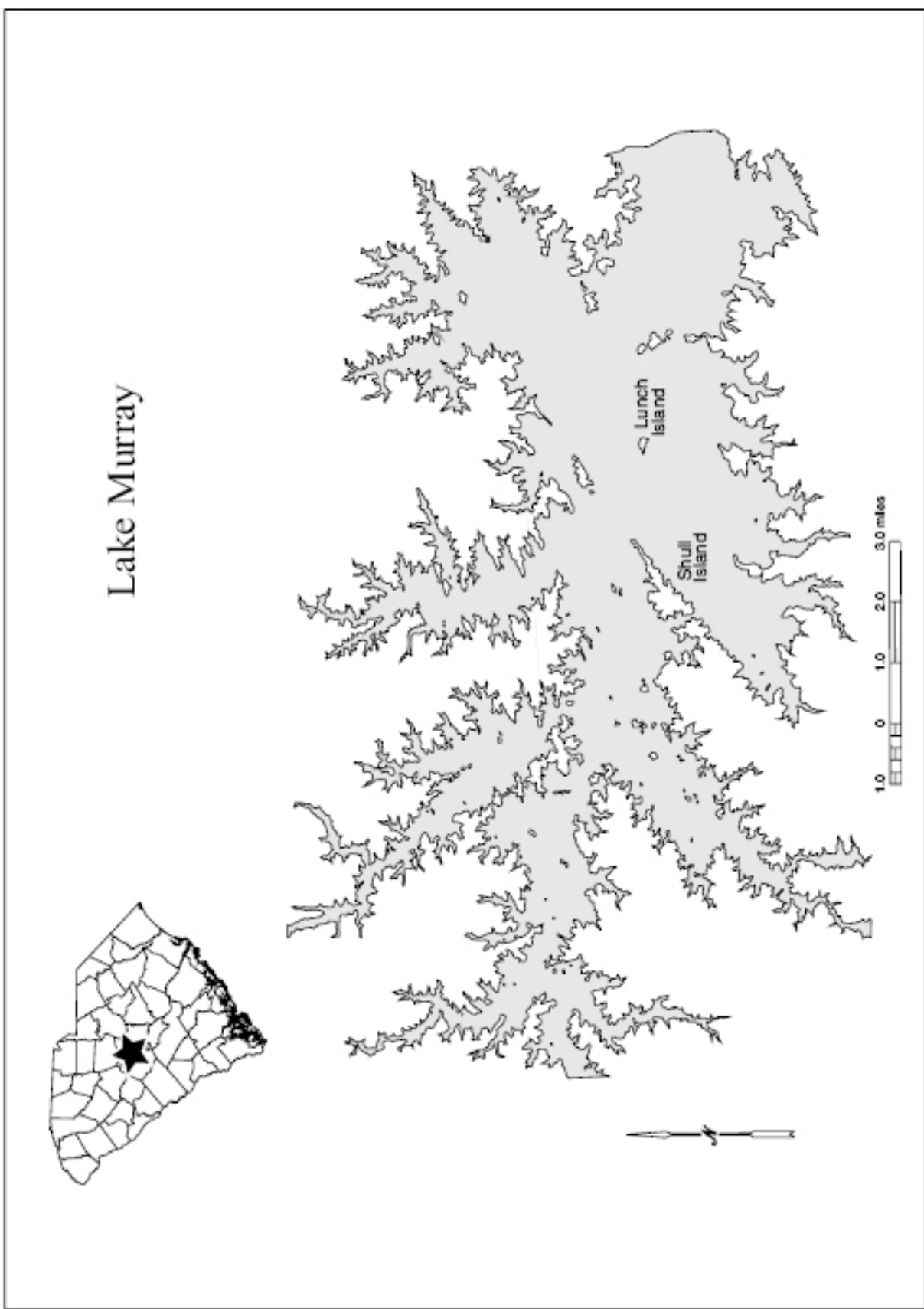
(Percentage of match subject to change based on availability of Federal and State funding.)

**Long term management strategy**

- d) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- e) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.
- f) Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.
- g) Improve public awareness and understanding of aquatic plant management activities through the maintenance of the Lake Murray Aquatic Plant Management web site. The web site includes up-to-date information on annual management plans, dates and locations of

current and historical control operations, locations of habitat enhancement activities, and other pertinent information.

- h) Periodically revise the management strategy and specific control sites as new environmental data and control agents and techniques become available and public use patterns change.



## **18. Lake Wateree**

### **(Fairfield, Kershaw and Lancaster Counties)**

#### **Problem plant species**

Hydrilla

#### **Management objective**

Keep hydrilla growth suppressed to prevent its spread within the lake, help prevent its spread to adjacent public water, and minimize adverse impacts to water use activities.

#### **Selected control method**

Aquathol K

Fall/winter water level drawdown

#### **Area to which control is to be applied**

Aquathol K - At least 2 acres in cove near Lakeside Marina. (Hydrilla has not been observed in several years on Lake Wateree, therefore no applications are needed at this time.)

Drawdown - Entire Lake

#### **Rate of control agent to be applied**

Aquathol K - 4 ppm (about 8 gallons per acre depending on depth)

Drawdown - To the greatest extent possible within project limits.

#### **Method of application of control agent**

Aquathol K - Subsurface injection from airboat with adjuvant.

Drawdown - Draw lake down

#### **Timing and sequence of control application**

Aquathol K - 2 acres treated twice in June and again in fall of year.

Drawdown - Drawdown lake from October through February.

#### **Other control application specifications**

Aquathol K - Herbicide used only upon notification of all local potable water supply authorities and approval by S.C. Department of Health and Environmental Control. Treatment of control area will be conducted in a manner that will not significantly degrade water quality.

Drawdown - Extent and duration of drawdown is dependent on operational limits of hydroelectric project, Federal regulations, electric demand, precipitation, and inflow.

#### **Entity to apply control agent**

Herbicide application - Commercial applicator or Duke Power Company

Drawdown - Duke Power Company

#### **Estimated cost of control operations**



Herbicide application - \$0.00 (Hydrilla has not been observed in several years on Lake Wateree, therefore no applications are needed at this time.)

Drawdown - Undetermined

**Potential sources of funding**

Duke Power Company 50%

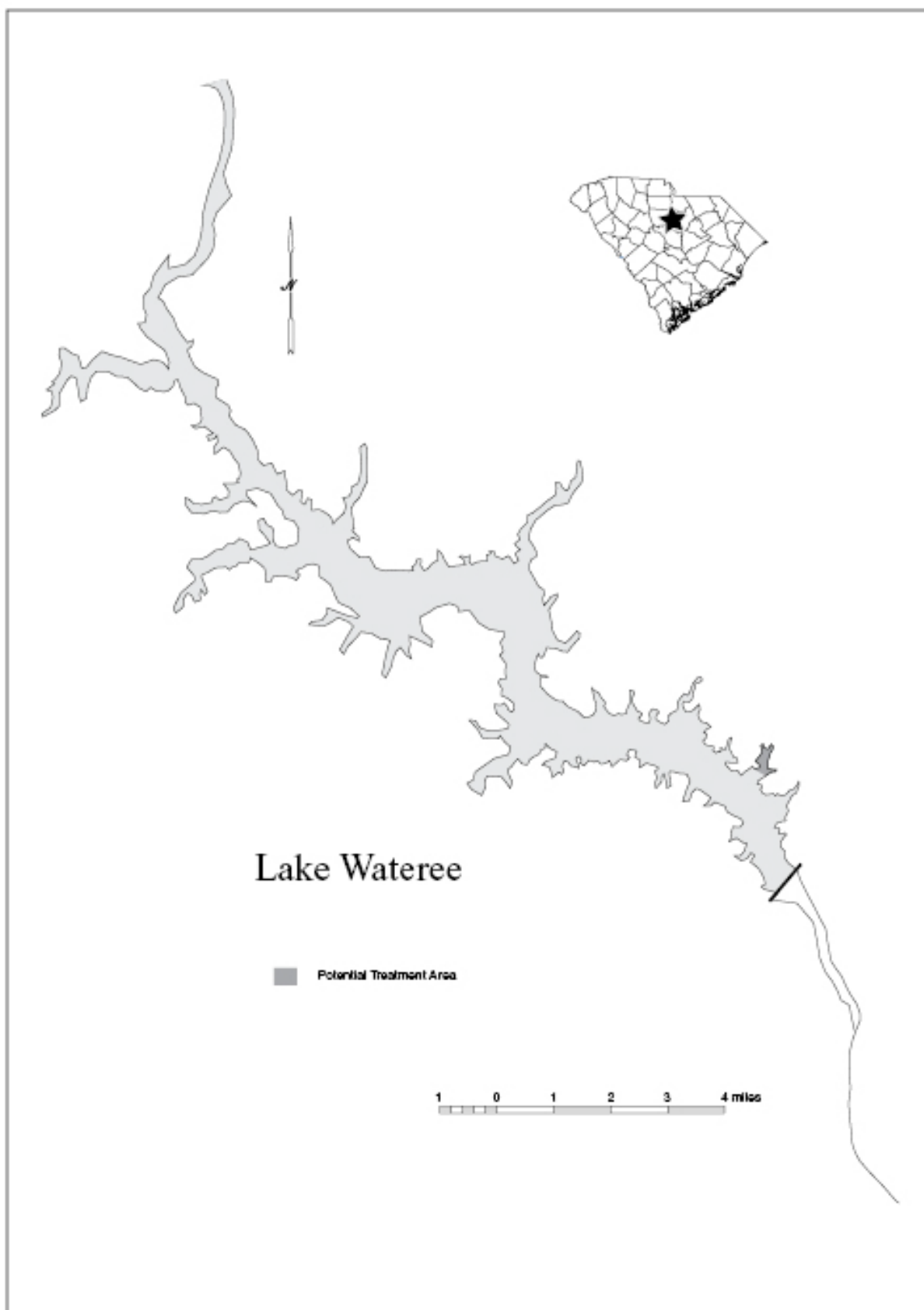
U.S. Army Corps of Engineers 0%

S.C. Department of Natural Resources 50% (up to \$30,000 cost share per waterbody)

(Percentage of match subject to change based on availability of Federal and State funding.)

**Long term management strategy**

- a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.
- c) Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.



## 19. Little Pee Dee River (Marion and Horry Counties)

### Problem plant species

Alligatorweed, Water hyacinth

### Management objective

Through a comprehensive, multi-year approach; reduce water hyacinth and alligatorweed populations to the greatest extent possible

### Selected control method

Problem Species	Control Agent
Water hyacinth	Renovate 3, Reward, Clearcast, Glyphosate, Galleon SC
Alligatorweed	Renovate 3, Reward, Habitat, Clearcast, Glyphosate
Biological Control -	Alligatorweed flea beetles, <i>Agasicles hygrophila</i>

### Area to which control is to be applied

30 acres of alligatorweed and water hyacinth throughout river

### Rate of control agent to be applied

Habitat - 0.250 to 0.750 gallons per acre.

Reward - 0.500 gallons per acre.

Renovate 3 - 0.250 to 0.750 gallons per acre.

Clearcast - 0.125 to 0.750 gallons per acre.

Glyphosate - up to 0.937 gallons per acre.

Galleon SC - 2 to 6 fluid ounces per acre as foliar application.

### Method of application of control agent

Herbicide - Spray on surface of foliage with appropriate surfactant.

Biological Control - Release in the vicinity of alligatorweed populations to supplement existing populations of alligatorweed flea beetles

### Timing and sequence of control application

Apply after plants are actively growing (May - Oct.).

### Other control application specifications

None

### Entity to apply control agent

Commercial applicator

### Estimated cost of control operations

\$1,500

**Potential sources of funding**

Horry and Marion Counties 50%

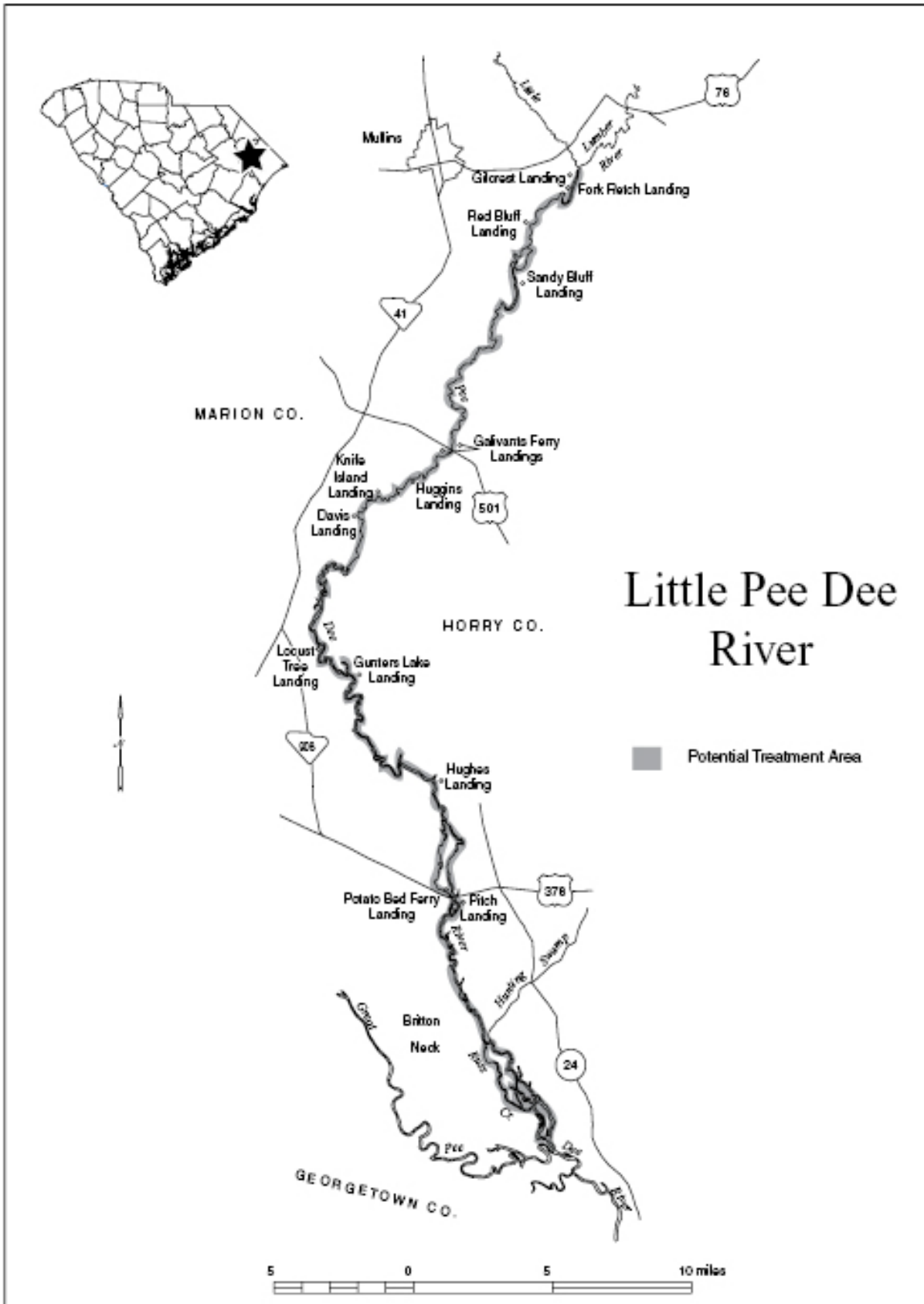
U.S. Army Corps of Engineers 0%

S.C. Department of Natural Resources 50% (up to \$30,000 cost share per waterbody)

(Percentage of match subject to change based on availability of Federal and State funding.)

**Long term management strategy**

- a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.
- c) Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.
- d) Continue to coordinate treatment areas with local conservation groups and State Scenic Rivers Coordinator.



## 20. Lumber River (Marion and Horry Counties)

### Problem plant species

Alligatorweed

### Management objective

Reduce or remove alligatorweed infestation at public access points, the main river channel, and connecting lakes.

### Selected control method

Herbicides - Renovate 3, Habitat, Clearcast, Glyphosate, Galleon SC

Biological Control - Alligatorweed flea beetles, *Agasicles hygrophila*

### Area to which control is to be applied

20 5acres of problematic plants throughout river

### Rate of control agent to be applied

Renovate 3 - 0.500 to 0.750 gallons per acre.

Habitat - 0.250 to 0.750 gallons per acre.

Clearcast - 0.250 to 0.750 gallons per acre.

Glyphosate - up to 0.937 gallons per acre.

Galleon SC - 2 to 6 fluid ounces per acre as foliar application.

### Method of application of control agent

Herbicide - Spray on surface of foliage with appropriate surfactant.

Biological Control - Release in the vicinity of alligatorweed populations to supplement existing populations of alligatorweed flea beetles

### Timing and sequence of control application

Apply after plants are actively growing (May - Oct.).

### Other control application specifications

None

### Entity to apply control agent

Commercial applicator

### Estimated cost of control operations

\$500

### Potential sources of funding

Horry and Marion Counties 50%

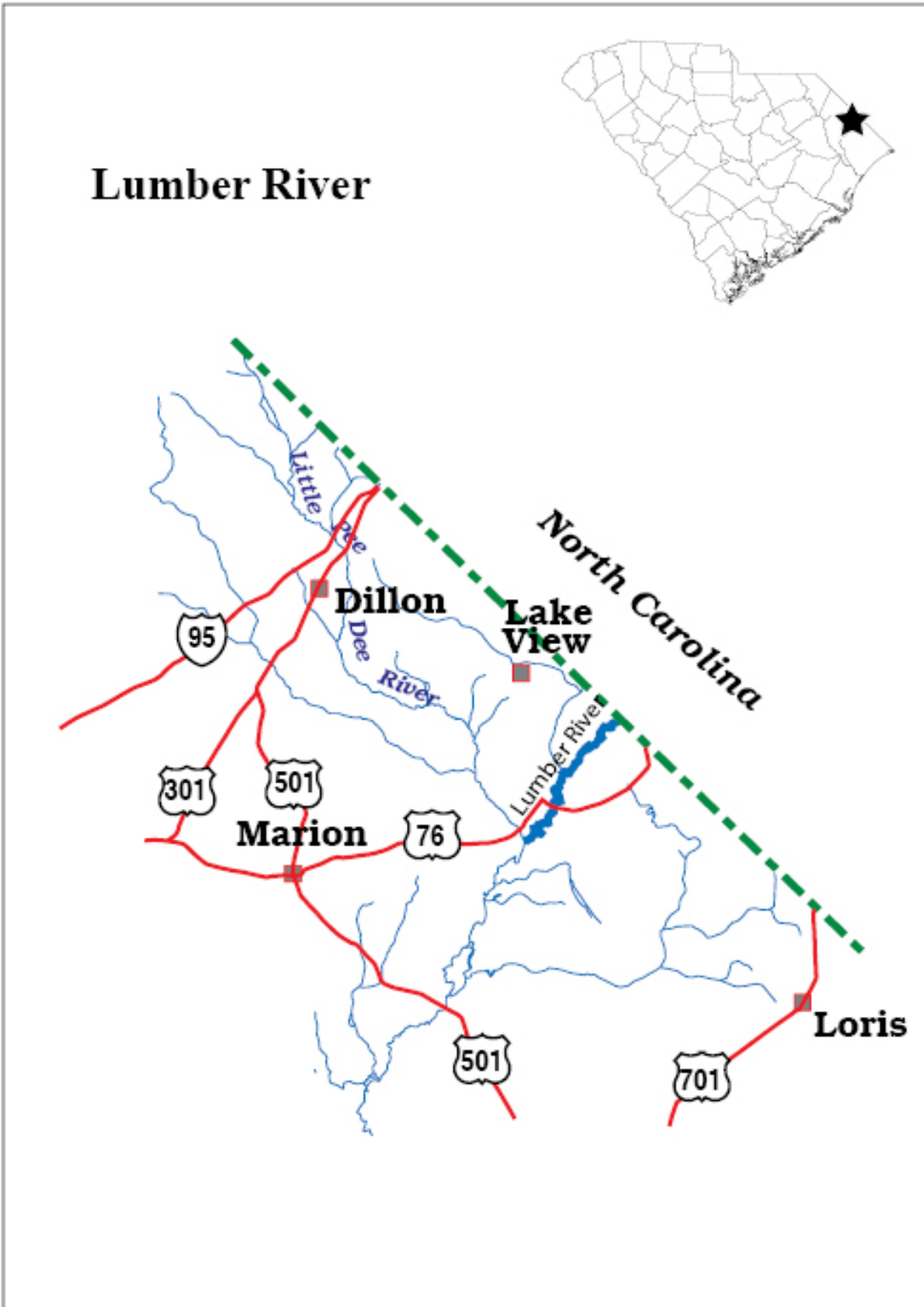
U.S. Army Corps of Engineers 0%

S.C. Department of Natural Resources 50% (up to \$30,000 cost share per waterbody)

(Percentage of match subject to change based on availability of Federal and State funding.)

**Long term management strategy**

- a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.
- c) Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.
- d) Continue to coordinate treatment areas with local conservation groups and State Scenic Rivers Coordinator.





## 21. Pee Dee River (Georgetown County)

### Problem plant species

Water hyacinth, Phragmites

### Management objective

Through a comprehensive, multi-year approach; reduce water hyacinth and Phragmites populations to the greatest extent possible

### Selected control method

Problem Species	Control Agents
Water hyacinth	Reward, Renovate 3, Clearcast, Habitat, Galleon SC
Phragmites	Habitat, Glyphosate, Clearcast

### Area to which control is to be applied

25 acres of water hyacinth throughout river and adjacent public ricefields.

5 acres of phragmites in the Sandy Island area.

### Rate of control agent to be applied

Reward - 0.500 gallons per acre.

Glyphosate – up to 0.937 gallons per acre

Renovate 3 - 0.500 to 0.750 gallons per acre.

Habitat - 0.250 to 0.750 gallons per acre.

Clearcast - 0.250 to 0.750 gallons per acre.

Galleon SC - 2 to 6 fluid ounces per acre as foliar application.

### Method of application of control agent

Helicopter, airboat - 35 acres of herbicide applied to water hyacinth (Sandy Island Area 10 acres). 5 acres of Habitat applied to phragmites (Sandy Island Area 5 acres).

### Timing and sequence of control application

Reward, Renovate 3, Clearcast, Habitat, Glyphosate, Galleon SC - to be applied periodically to water hyacinth from May through October.

Habitat, Clearcast, Glyphosate - Apply when plants are actively growing.

### Other control application specifications

None

### Entity to apply control agent

Commercial applicator

### Estimated cost of control operations

\$5,500

**Potential sources of funding**

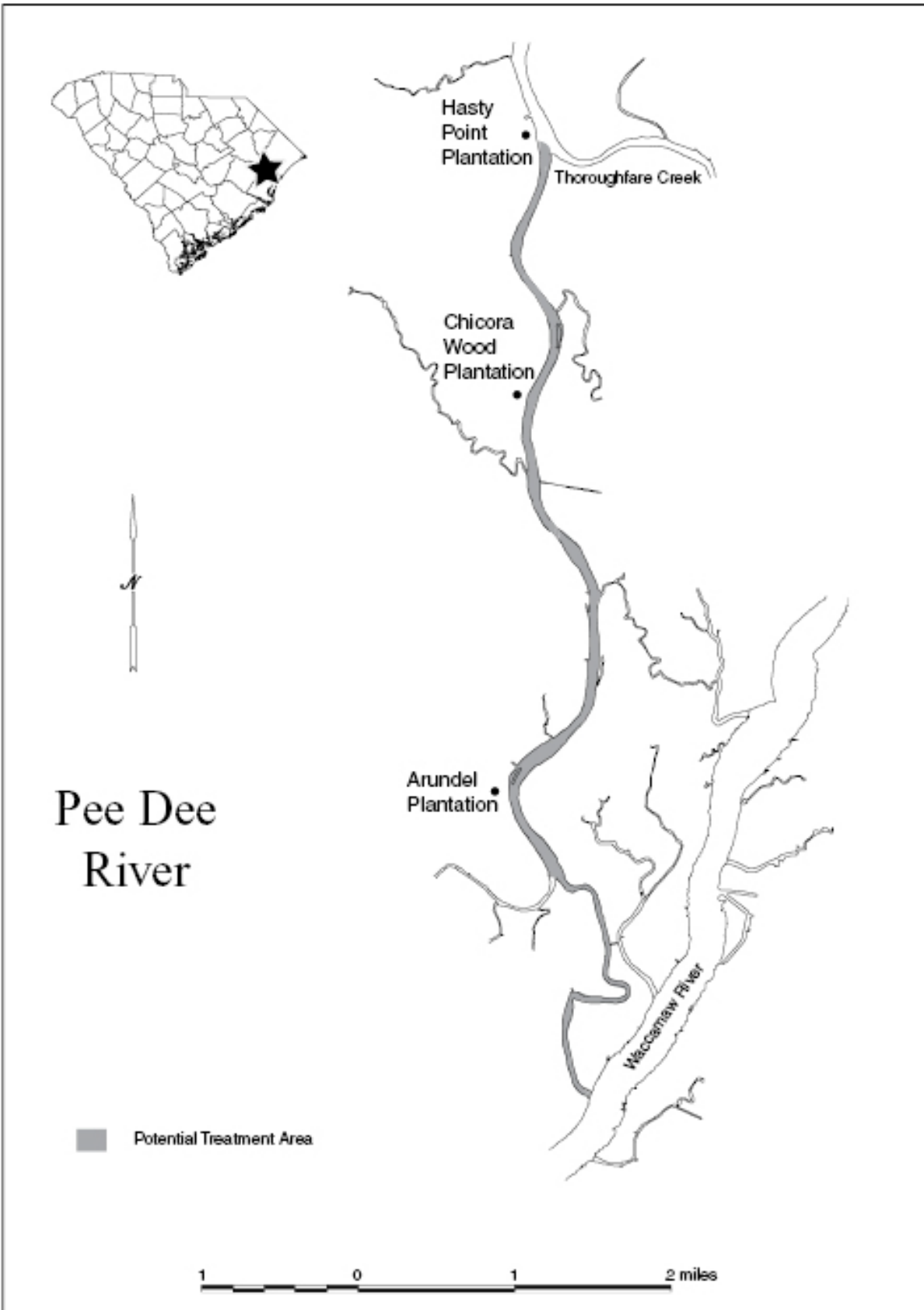
Georgetown County 50%

U.S. Army Corps of Engineers 0% S.C. Department of Natural Resources 50% (up to \$30,000 cost share per waterbody)

(Percentage of match subject to change based on availability of Federal and State funding.)

**Long term management strategy**

- a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.
- c) Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.



## 22. Samworth WMA (Georgetown County)

### Problem plant species

Water hyacinth, Phragmites

### Management objective

Through a comprehensive, multi-year approach; reduce water hyacinth and Phragmites populations to the greatest extent possible

### Selected control method

Problem Species	Control Agents
Water hyacinth	Reward, Renovate 3, Clearcast, Habitat, Galleon SC
Phragmites	Habitat, Clearcast, Glyphosate

### Area to which control is to be applied

30 acres of water hyacinth throughout river and adjacent public ricefields.

10 acres of phragmites in the Sandy Island area and Samworth WMA.

### Rate of control agent to be applied

Reward - 0.500 gallons per acre.

Renovate 3 - 0.500 to 0.750 gallons per acre.

Glyphosate – up to 0.937 gallons per acre.

Habitat - 0.250 to 0.750 gallons per acre.

Clearcast - 0.250 to 0.750 gallons per acre.

Galleon SC - 2 to 6 fluid ounces per acre as foliar application.

### Method of application of control agent

Helicopter, airboat - 40 acres of herbicide applied to water hyacinth. 10 acres of Habitat, Glyphosate applied to phragmites.

### Timing and sequence of control application

Reward, Renovate 3, Clearcast, Habitat, Glyphosate, Galleon SC - to be applied periodically to water hyacinth from May through October.

Habitat, Clearcast, Glyphosate - Apply when plants are actively growing.

### Other control application specifications

None

### Entity to apply control agent

Commercial applicator

### Estimated cost of control operations

\$5,000

**Potential sources of funding**

Samworth WMA 50%

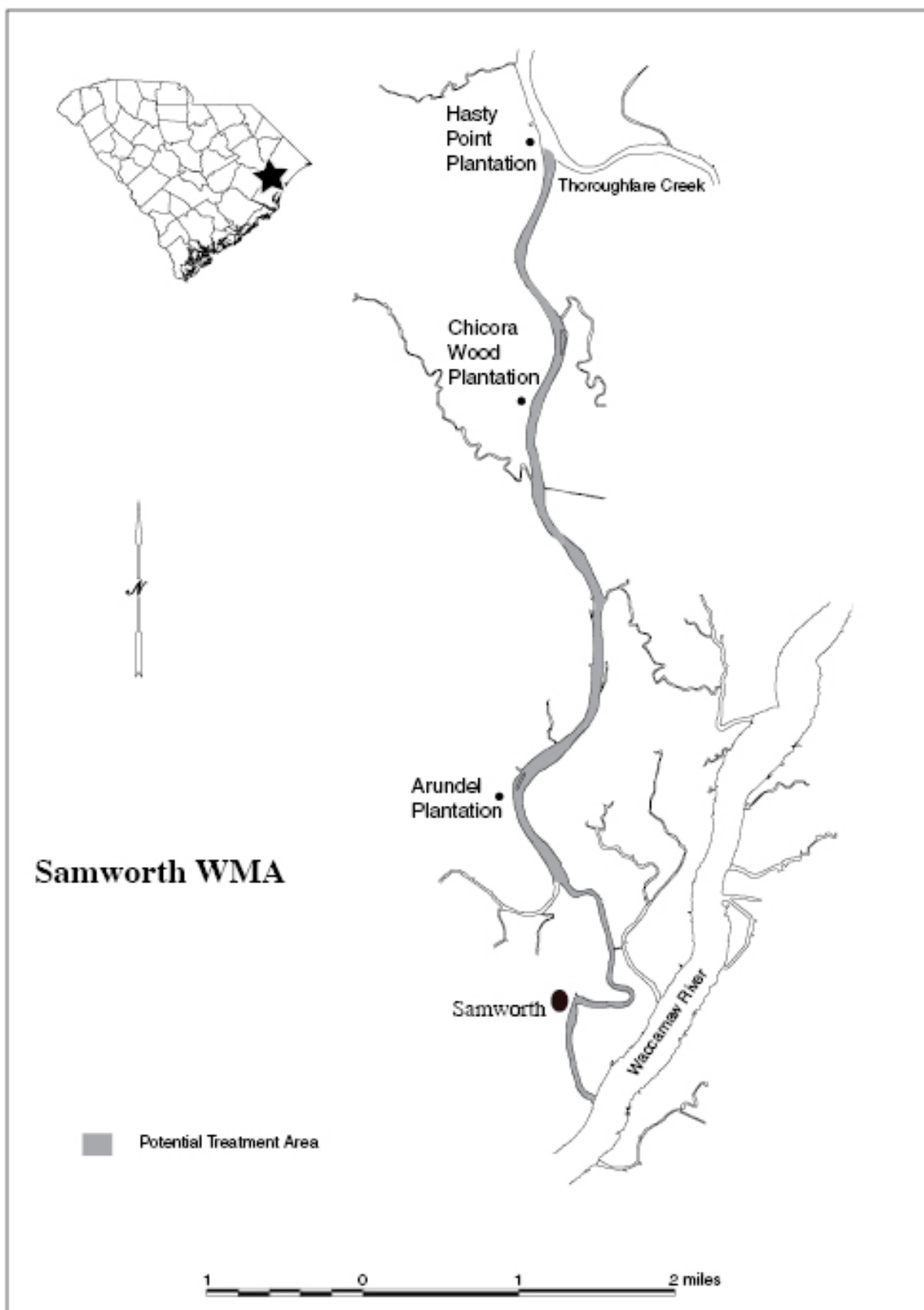
U.S. Army Corps of Engineers 0%

S.C. Department of Natural Resources 50% (up to \$30,000 cost share per waterbody)

(Percentage of match subject to change based on availability of Federal and State funding.)

**Long term management strategy**

- a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.
- c) Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.



## **23. Santee Coastal Reserve (Charleston and Georgetown Counties)**

### **Problem plant species**

Phragmites

### **Management objective**

Through a comprehensive, multi-year approach; reduce Phragmites populations to the greatest extent possible throughout the Santee Coastal Reserve.

### **Selected control method**

Habitat, Clearcast, Glyphosate

### **Area to which control is to be applied**

200 acres of phragmites throughout the ricefields.

### **Rate of control agent to be applied**

Habitat - 0.500 to 0.750 gallons per acre.  
Glyphosate – up to 0.937 gallons per acre.  
Clearcast - 0.500 to 0.750 gallons per acre.

### **Method of application of control agent**

Spray on surface of foliage with appropriate surfactant.

### **Timing and sequence of control application**

Apply after plants are actively growing (May - Oct.).

### **Other control application specifications**

Application to be conducted by ground application or airboat. Helicopter applications should be utilized at a minimum of every 3 years or when substantial regrowth occurs.

### **Entity to apply control agent**

Commercial applicator

### **Estimated cost of control operations**

\$31,000

### **Potential sources of funding**

Santee Coastal Reserve 50%

U.S. Army Corps of Engineers 0%

S.C. Department of Natural Resources 50% (up to \$30,000 cost share per waterbody)

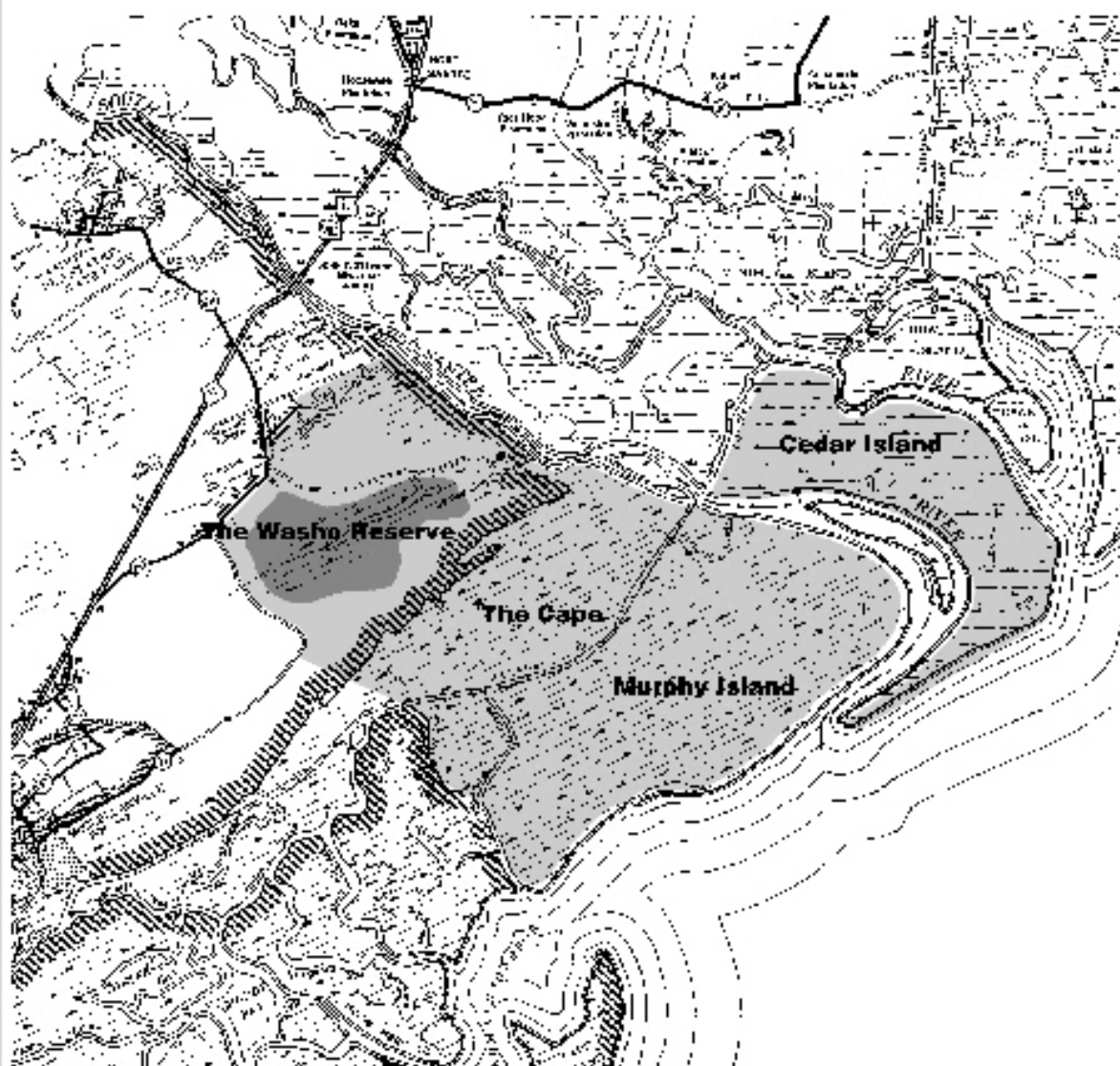
(Percentage of match subject to change based on availability of Federal and State funding.)

### **Long term management strategy**

- a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.



## Santee Coastal Reserve



## **24. Santee Delta WMA (Georgetown County)**

### **Problem plant species**

Phragmites

### **Management objective**

Through a comprehensive, multi-year approach; reduce Phragmites populations to the greatest extent possible.

### **Selected control method**

Habitat, Clearcast, Glyphosate

### **Area to which control is to be applied**

10 acres of Phragmites throughout the ricefields.

### **Rate of control agent to be applied**

Habitat - 0.500 to 0.750 gallons per acre.  
Glyphosate – up to 0.937 gallons per acre  
Clearcast - 0.500 to 0.750 gallons per acre.

### **Method of application of control agent**

Spray on surface of foliage with appropriate surfactant.

### **Timing and sequence of control application**

Apply after plants are actively growing (May - Oct.).

### **Other control application specifications**

Application to be conducted by ground application or airboat. Helicopter applications should be utilized at a minimum of every 3 years or when substantial regrowth occurs.

### **Entity to apply control agent**

Commercial applicator

### **Estimated cost of control operations**

\$1,500

### **Potential sources of funding**

Santee Coastal Reserve 50%

U.S. Army Corps of Engineers 0%

S.C. Department of Natural Resources 50% (up to \$30,000 cost share per waterbody)

(Percentage of match subject to change based on availability of Federal and State funding.)

### **Long term management strategy**

- a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.

## Santee Delta WMA



## 25. U.S. Army Corps of Engineers Charleston Harbor/Intracoastal Waterway (Charleston County)

### Problem plant species

Phragmites

### Management objective

Through a comprehensive, multi-year approach; reduce Phragmites populations to the greatest extent possible

### Selected control method

Problem Species	Control Agent
Phragmites	Habitat, Clearcast, Glyphosate

### Area to which control is to be applied

200 acres of phragmites throughout area

### Rate of control agent to be applied

Habitat - 0.500 to 0.750 gallons per acre.  
Glyphosate – up to 0.937 gallons per acre.  
Clearcast – 0.500 to 0.75 gallons per acre.

### Method of application of control agent

Helicopter - 200 acres of Habitat applied to phragmites.  
Other applications - Spray on surface of foliage with appropriate surfactant.

### Timing and sequence of control application

Apply when plants are actively growing (July - Oct.).

### Entity to apply control agent

Commercial applicator

### Other control application specifications

None

### Estimated cost of control operations

\$31,000

### Potential sources of funding (\*\*Currently no funding available)

U.S. Army Corps of Engineers (Charleston Harbor Funds) 100%

S.C. Department of Natural Resources 0%

(Percentage of match subject to change based on availability of Federal and State funding.)

**Long term management strategy**

- a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.
- c) Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.
- d) Continue to coordinate treatment areas with local conservation groups.

## Charleston Harbor Dredge Spoil Areas



## 26. US Navy, Naval Weapons Station (Charleston, Berkeley County)

### Problem plant species

Phragmites

### Management objective

Through a comprehensive, multi-year approach; reduce Phragmites populations to the greatest extent possible in spoil areas and control invasive.

### Selected control method

Problem Species	Control Agent
Phragmites	Habitat, Clearcast, Glyphosate

### Area to which control is to be applied

50 acres of Phragmites populations in dredge spoil areas.

### Rate of control agent to be applied

Habitat - 0.500 to 0.750 gallons per acre.  
Clearcast - 0.500 to 0.750 gallons per acre.  
Glyphosate - up to 0.937 gallons per acre.

### Method of application of control agent

Spray on surface of foliage with appropriate surfactant.

### Timing and sequence of control application

Apply after plants are actively growing (May - Oct.).

### Other control application specifications

Application to be conducted by helicopter, airboat and jon-boat.

### Entity to apply control agent

Commercial applicator

### Estimated cost of control operations

\$7,500

### Potential sources of funding

US Naval Weapons Station 50%  
S.C. Department of Natural Resources 50% (up to \$30,000 cost share per waterbody)  
(Percentage of match subject to change based on availability of Federal and State funding.)

### Long term management strategy



- a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.

**US Navy Naval Weapons Station**



**NO MAP AVAILABLE**

## 27. Waccamaw River (Horry County)

### Problem plant species

Water hyacinth, Phragmites

### Management objective

Through a comprehensive, multi-year approach; reduce water hyacinth and Phragmites populations to the greatest extent possible

### Selected control method

Problem Species	Control Agents
Water hyacinth	Reward, Renovate 3, Clearcast, Galleon SC
Phragmites	Habitat, Clearcast

### Area to which control is to be applied

50 acres throughout river system where needed.

### Rate of control agent to be applied

Reward - 0.500 gallons per acre.  
Renovate 3 - 0.500 to 0.750 gallons per acre.  
Glyphosate – up to 0.937 gallons per acre.  
Habitat - 0.500 to 0.750 gallons per acre.  
Clearcast - 0.500 to 0.750 gallons per acre.  
Galleon SC - 2 to 6 fluid ounces per acre as foliar application.

### Method of application of control agent

Spray on surface of foliage with appropriate surfactant

### Timing and sequence of control application

Herbicide to be applied to water hyacinth periodically from late May through November.

### Other control application specifications

Herbicide used only upon approval by S.C. Department of Health and Environmental Control. Treatment of control area will be conducted in a manner that will not significantly degrade water quality.

### Entity to apply control agent

Commercial applicator

### Estimated cost of control operations

\$ 4,000

### Potential sources of funding

Horry County 25%

Brookgreen Gardens 25%

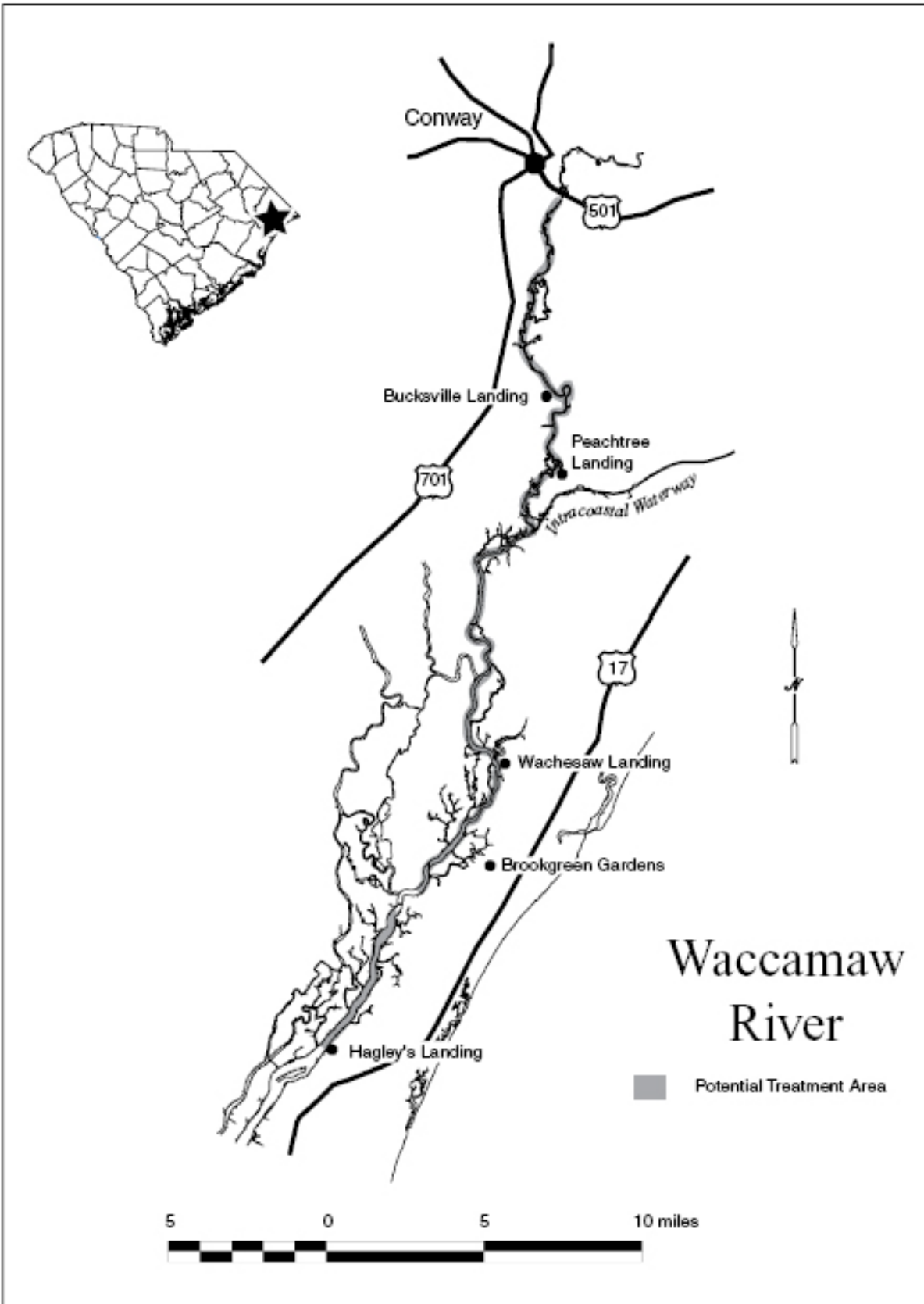
U.S. Army Corps of Engineers 0%

S.C. Department of Natural Resources 50% (up to \$30,000 cost share per waterbody)

(Percentage of match subject to change based on availability of Federal and State funding.)

**Long term management strategy**

- a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.
- c) Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.



## **28. Yawkey Wildlife Center (Georgetown County)**

### **Problem plant species**

Phragmites, Cattails, Cutgrass

### **Management objective**

Through a comprehensive, multi-year approach; reduce Phragmites populations to the greatest extent possible.

### **Selected control method**

Habitat, Clearcast, Glyphosate

### **Area to which control is to be applied**

25 acres of Phragmites, cattails, and cutgrass throughout the ricefields.

### **Rate of control agent to be applied**

Habitat - 0.500 to 0.750 gallons pints per acre.

Clearcast - 0.500 to 0.750 gallons per acre.

Glyphosate - up to 0.937 gallons per acre

### **Method of application of control agent**

Spray on surface of foliage with appropriate surfactant.

### **Timing and sequence of control application**

Apply after plants are actively growing (May - Oct.).

### **Other control application specifications**

Application to be conducted by airboat, ground, or helicopter. Phragmites control in impounded areas should only occur where drainage has left areas moderately dry

### **Entity to apply control agent**

Commercial applicator

### **Estimated cost of control operations**

\$3,850

### **Potential sources of funding**

Yawkey Foundation 50%

U.S. Army Corps of Engineers 0%

S.C. Department of Natural Resources 50% (up to \$30,000 cost share per waterbody)

(Percentage of match subject to change based on availability of Federal and State funding.)

### **Long term management strategy**

- a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.

## Yawkey Wildlife Center





## Santee Cooper Lakes

### 29. Lake Marion

(Calhoun, Clarendon, Orangeburg, Berkeley, and Sumter Counties)

### 30. Lake Moultrie

(Berkeley County)

**NOTE: The following management plan applies to both lakes.**

#### **Problem plant species**

Hydrilla, Alligatorweed, Fanwort, Water willow, Water hyacinth, Slender naiad, Water primrose, Giant cutgrass, Coontail, Filamentous algae (Lyngbya), Slender pondweed, Crested floating heart, Fragrant waterlily, Watermilfoil, Fanwort

#### **Management objectives**

Foster a diverse aquatic plant community through selective treatment of nuisance aquatic vegetation (to avoid adverse impacts to existing native plant species) and the introduction of desirable native plant species when and where appropriate.

Manage hydrilla growth throughout the main lakes and subimpoundments to minimize its spread within the lakes, help prevent its spread to adjacent public waters, and minimize adverse impacts to electric power generation, agricultural irrigation withdrawals, and public use and access.

Reduce water hyacinth populations throughout the lakes to enhance boating, fishing, hunting, public access and prevent spread to other areas of the lake.

Reduce Crested floating heart populations throughout the lakes to enhance boating, fishing, hunting, public access and prevent spread to other areas of the lake.

Reduce giant cutgrass populations throughout the lakes, especially in Wildlife Management Areas and upper Lake Marion, to enhance wildlife habitat and hunting opportunities.

Reduce fragrant waterlily and alligatorweed populations throughout Wildlife Management Areas to enhance wildlife habitat and hunting opportunities.

Reduce other nuisance aquatic vegetation in priority use areas, such as electric power generation facilities, public and commercial access sites (boat ramps, piers, swimming areas, marinas) and residential shoreline areas in the main lake and subimpoundments.

#### **Selected control method**

Problem Species	Control Agents
Hydrilla	Aquathol K, Sonar, chelated copper*, Triploid grass carp
Lyngbya	chelated copper*, peroxygen compounds
Water hyacinth	Reward, Renovate 3, Clearcast
Fanwort, coontail, slender naiad, slender pondweed	Aquathol K, Sonar, Reward

Water primrose, alligatorweed,      Glyphosate, Habitat, Renovate 3, Clearcast  
giant cutgrass

Crested floating heart      Aquathol K, Clearcast / Glyphosate, Renovate Max G

\* May be toxic to fish at recommended treatment rates; however, precautions will be implemented to minimize the risk of fish kills.

#### **Area to which control is to be applied**

Water hyacinth - Approximately 2000 acres throughout the system but mostly in the upper lake area above I-95 Bridge.

Hydrilla - Approximately 7200 acres in priority areas such as electric power generation facilities, public and commercial access sites (boat ramps, piers, swimming areas, marinas) and residential shoreline areas in the main lake and sub-impoundments. If conditions warrant, release triploid grass carp in close proximity to areas of the lake with the greatest hydrilla growth and use herbicide applications to provide immediate short-term control of localized growth in those areas.

Crested floating heart - Approximately 4000 acres in priority areas such as public and commercial access sites (boat ramps, piers, swimming areas, marinas, and residential shoreline areas in the main lake), and State and Federal wildlife management areas.

Giant Cutgrass - Approximately 200 acres along shoreline areas throughout lake system, as well as within State and Federal wildlife management areas.

Other target species - Approximately 100 acres in priority areas such as electric power generation facilities, public and commercial access sites (boat ramps, piers, swimming areas, marinas) and residential shoreline areas in the main lake and sub-impoundments.

Sub-Impoundments -

Dean's Swamp Impoundment, Potato Creek Impoundment, Church Branch Impoundment, Taw Caw Impoundment, Jack's Creek Impoundment

The general management strategy is to transition from hydrilla dominated plant communities to ones dominated by native plant species, which are beneficial to wildlife, by use of aquatic herbicides. Specific control methods for the sub-impoundments will be determined cooperatively between Santee Cooper and SCDNR staffs. Methods and goals will be consistent with both groups' interests for control of invasive plant species such as hydrilla while promoting vegetation beneficial to wildlife and waterfowl through other habitat enhancement projects.

#### **Rate of control agents to be applied**

Aquathol K - 5 to 10 gallons per acre (dependent on water depth).

Reward - 0.500 gallons per acre for floating plants; 2 gallons per acre for submersed plants.

Renovate 3 - 0.500 to 0.750 gallons per acre for emergent species, per label for submersed plants.

Habitat - 0.250 to 0.750 gallons per acre.

Sonar AS - 10 to 30 ppb.

Chelated Copper- up to 1 ppm.

Glyphosate - up to 1.25 gallons per acre.

Sonar Q, Sonar PR, sonar One - up to 40 ppb (approx 10 pounds/acre).

Clearcast - 0.250 to 1.00 gallons per acre.

Renovate Max G – up to 320 pounds per acre.

**Triploid grass carp** – During 2012, hydrilla continued to expand at a high rate. There was a 125% increase in acreage in 2012 compared to a 156% increase in 2011. The total hydrilla acreage for both Lake Marion and Lake Moultrie is 7210 in 2012 up from 3,244 acres in 2011 while the total of submersed vegetation climbed to 21971 acres.

Based on this information, the Aquatic Plant Management Council, with recommendations from DNR and Santee Cooper staff, agreed that the adaptive stocking plan should be continued. The parties mentioned above also concluded that additional stocking be implemented to reduce the increases in hydrilla acreage seen in 2012 (7210 acres, 125 percent increase from 2011). An additional stocking of 113,656 triploid carp will be stocked to bring the rate for the hydrilla acreage up to a management level of 25 fish per acre of hydrilla. This is identical to last year's stocking rate but it takes into account the additional acres of hydrilla. The research also suggest that in order to gain effective management 25 fish per acre should be stocked for any additional submersed species that are palatable to triploid carp. The Council does not share that view and we have elected to be more conservative going with 10 triploid carp per acre instead of the 25. That number is 5,259 acres system wide and adds 52,590 triploid carp. This strategy brings the target sterile grass carp population to 232,840. Based on previous stocking models, the estimated current population is 87,720. Therefore, 145,120 fish would need to be stocked this year to reach the target population. Because of the inability of contractors to deliver all carp in the spring 31,464 carp were stocked after the conclusion of 2012 surveys in October. Those numbers will be deducted from 2012 stocking numbers and credited to the 2013 stocking for a final count of 113,656 triploid carp to be stocked in 2013.

SCDNR and Santee Cooper Staff will carefully monitor Lake Marion and Lake Moultrie for additional increases in hydrilla acreage or loss of native vegetation. Herbicide treatments will be used to provide temporary control of hydrilla until results from grass carp feeding become apparent. Changes to the strategy will be implemented if survey results, regrowth, or habitat loss warrant.

#### **Method of application of control agents**

Aquathol K, chelated copper, Sonar - subsurface application by airboat or surface application by helicopter.

Reward - (water hyacinth) spray on surface of foliage using handgun from airboat or by helicopter with appropriate surfactant ;( submersed plants) subsurface application.

Renovate 3, Glyphosate, Habitat, Clearcast - spray on surface of foliage with appropriate surfactant.

Renovate Max G – Distribute granular product evenly over the surface at the prescribed rate.

Triploid grass carp – Using standard techniques to minimize loss, stock sterile grass carp in areas of the lake with the greatest hydrilla growth.

#### **Timing and sequence of control application**

Herbicide applications - All herbicide applications to be applied when plants are actively growing. Water hyacinth and hydrilla treatments should be initiated in spring when plant

growth begins and continued regularly during the year as needed to reduce biomass as much as possible.

Triploid grass carp to be released as soon as possible in the spring of 2013 (March-May).  
RESULTS FROM GRASS CARP MAY NOT BE EVIDENT FOR TWO OR MORE YEARS.

#### Other control application specifications

Treatment of the control area is to be conducted in a manner that will not significantly degrade water quality. This may require that only a portion of the control area be treated at any one time.

Hydrilla, Water hyacinth and Crested floating heart treatments should be considered a high priority to minimize spread to other areas of the lake system. Treatments should be conducted wherever the plants occur and access by boat is feasible. Areas inaccessible by boat or large acreages will be treated aerially. Frequent treatments in these areas will be necessary to meet management objectives.

If available, all sterile grass carp will be a minimum of 12 inches in length. Sterile grass carp shipments for the Santee Cooper Lakes will be certified by the SCDNR for sterility and checked for size and condition prior to stocking in the lake.

#### Entity to apply control agents

Herbicide application - S.C. Public Service Authority and/or commercial applicator.

Triploid Grass Carp -

Commercial supplier with supervision by S.C. Public Service Authority and/or SCDNR.

#### Estimated cost of control operations

\$1,200,000

Note: The budgeted amount is based on aquatic plant coverage and treatment needs from previous years. Actual expenditures will depend on the extent of noxious aquatic plant growth in 2013 and available funds provided by South Carolina Public Service Authority.

#### Potential sources of funding

S.C. Public Service Authority 50%

U.S. Army Corps of Engineers 0%

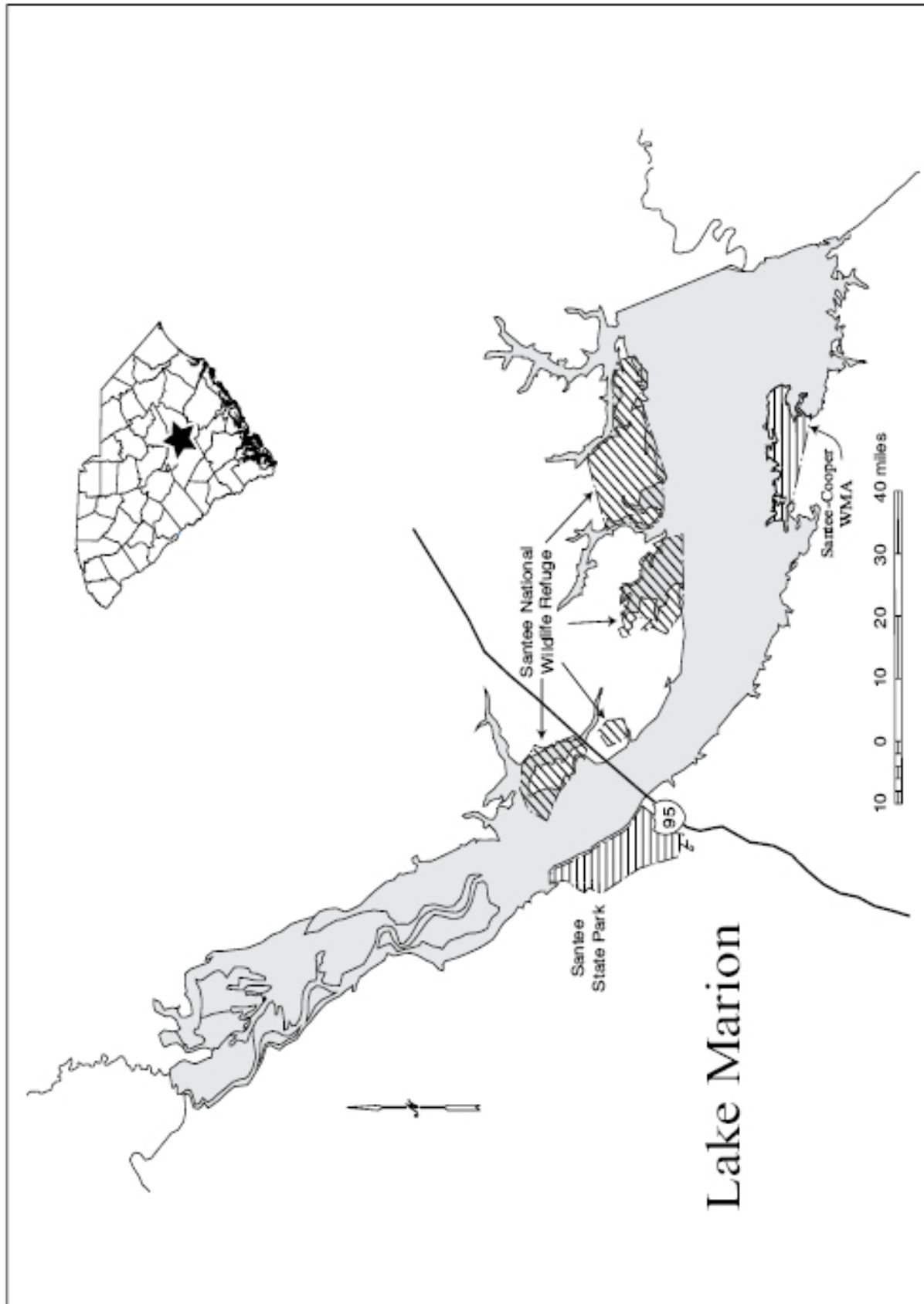
S.C. Department of Natural Resources 50% (up to \$30,000 cost share per waterbody)

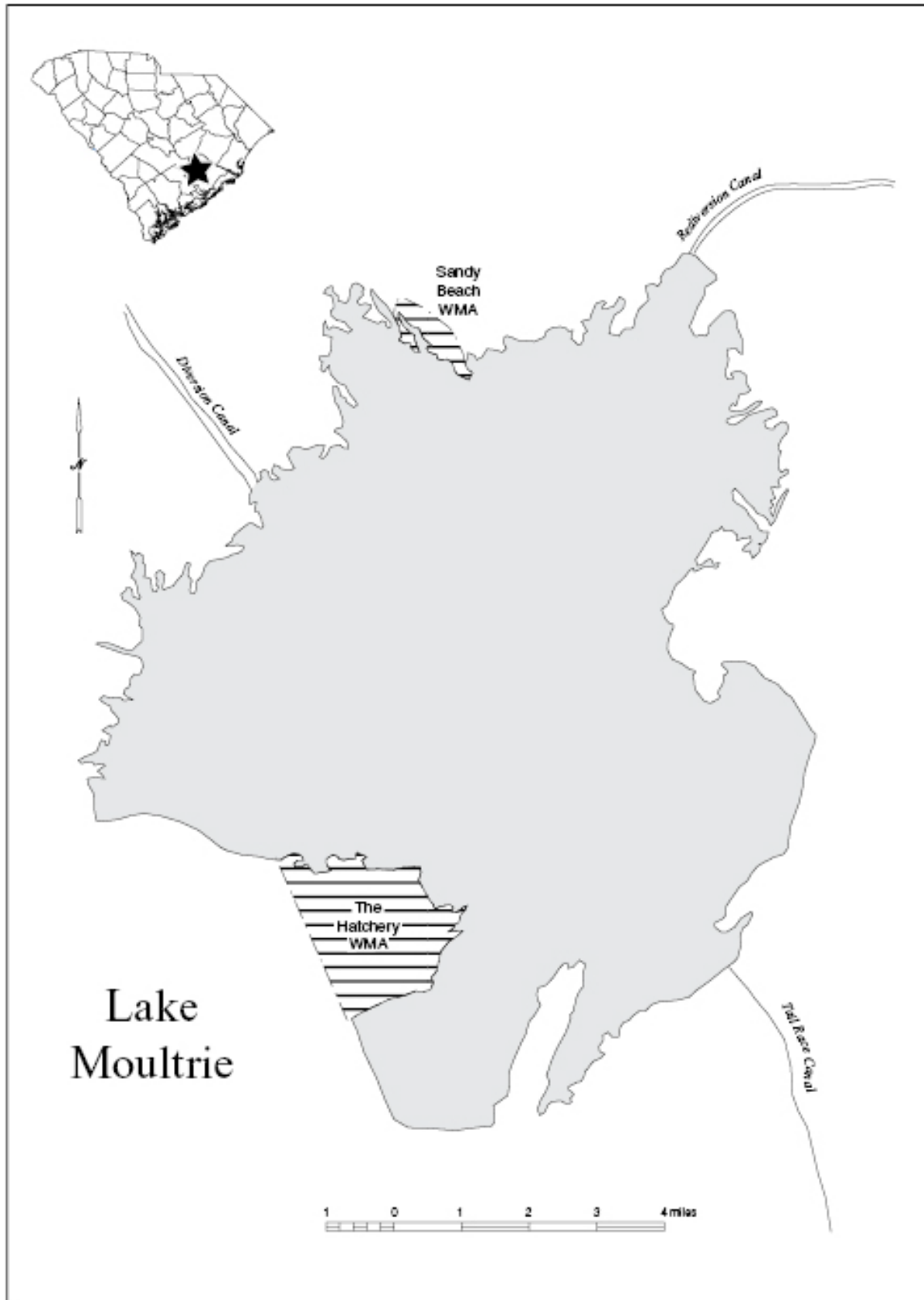
(Percentage of match subject to change based on availability of Federal and State funding.)

#### Long term management strategy

- a) Support the management goals established by the DNR and Santee Cooper (Appendix E) which attempts to achieve a diverse assemblage of native aquatic vegetation in a minimum of 10% of the total surface area of the lake and to effectively control non-native invasive species.

- b) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- c) A long-term integrated adaptive management strategy has been implemented to control hydrilla. Triploid grass carp have been stocked to control hydrilla growth lake-wide and approved aquatic herbicides are used to control localized growth in priority use areas. Future plans include annual stocking of grass carp to maintain the population at a level that is sufficient to maintain control of hydrilla but to minimize impacts on desirable native plant populations.
- d) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.
- e) Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.
- f) Periodically revise the management strategy and specific control sites as new environmental data, management agents and techniques, and public use patterns become available.





## South Carolina Department of Parks, Recreation and Tourism State Park Lakes

### 31. Aiken State Park (Aiken County)

#### **Problem plant species**

Floating Heart, Cattails

#### **Management objective**

Reduce or remove problem plants to the extent they do not interfere with recreational opportunities.

#### **Selected control method**

Floating Heart – Renovate Max G

Cattails – Habitat, Glyphosate

#### **Area to which control is to be applied**

10 acres in three lakes

#### **Rate of control agent to be applied**

Renovate Max G – 200 lbs per acre.

Habitat – 0.500 – 0.750 gallons per acre.

Glyphosate – up to 0.937 gallons per acre.

#### **Method of application of control agent**

Foliar application using appropriate surfactant from airboat. Granular herbicides spread evenly using appropriate rate.

#### **Timing and sequence of control application**

Apply when plants are actively growing.

#### **Other control application specifications**

Monitor plant growth prior to treatment.

#### **Entity to apply control agent**

Commercial applicator contracted and monitored by SCPRT.

#### **Estimated cost of control operations**

\$6,000

#### **Potential sources of funding**

S.C. Department of Parks, Recreation and Tourism 50%

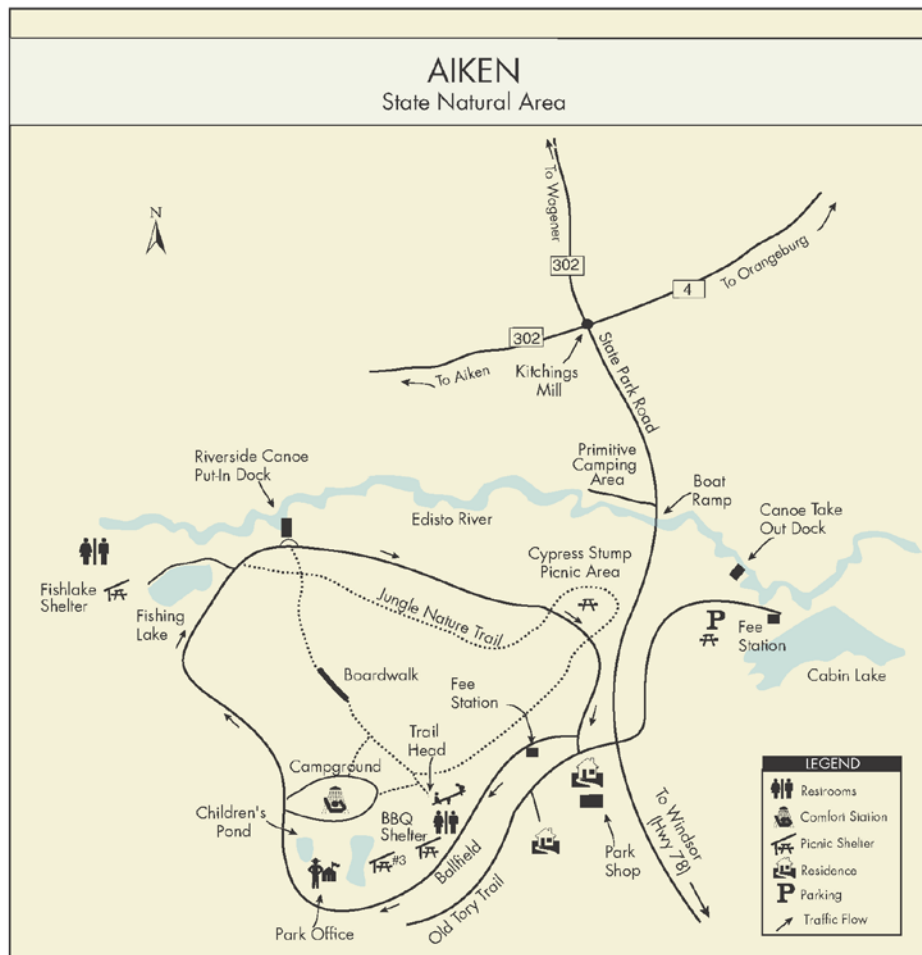
S.C. Department of Natural Resources 50% (up to \$30,000 cost share per waterbody)



(Percentage of match subject to change based on availability of Federal and State funding.)

**Long term management strategy**

- a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.
- c) Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.



## **32. Barnwell State Park (Swimming Lake) (Barnwell County)**

### **Problem plant species**

Waterlily, Cattails

### **Management objective**

Reduce or remove problem plants to the extent they do not interfere with recreational opportunities.

### **Selected control method**

Waterlily – Renovate Max G

Cattails – Habitat, Glyphosate

### **Area to which control is to be applied**

3 acres in swimming lake.

6 acres in Upper lake.

### **Rate of control agent to be applied**

Renovate Max G – 200 lbs per acre.

Habitat – 0.500 – 0.750 gallons per acre.

Glyphosate – up to 0.937 gallons per acre.

### **Method of application of control agent**

Foliar application using appropriate surfactant from airboat. Granular herbicides spread evenly using appropriate rate.

### **Timing and sequence of control application**

Apply when plants are actively growing.

### **Other control application specifications**

Monitor plant growth prior to treatment.

### **Entity to apply control agent**

Commercial applicator contracted and monitored by SCPRT.

### **Estimated cost of control operations**

\$6,000

### **Potential sources of funding**

S.C. Department of Parks, Recreation and Tourism 50%

S.C. Department of Natural Resources 50% (up to \$30,000 cost share per waterbody)

(Percentage of match subject to change based on availability of Federal and State funding.)

**Long term management strategy**

- a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.
- c) Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.

## Barnwell State Park Swimming Lake



### 33. Charles Towne Landing State Park (Charleston County)

#### **Problem plant species**

Duckweed, Alligatorweed, Pennywort

#### **Management objective**

Reduce or remove problem plants to the extent they do not interfere with recreational opportunities.

#### **Selected control method**

Problems species	Control Agent
Duckweed	Fluridone, Clipper, Galleon SC
Alligatorweed	Renovate 3, Habitat, Clearcast, Glyphosate
Pennywort	Renovate 3, Habitat, Clearcast, Glyphosate

#### **Area to which control is to be applied**

Fluridone, Galleon SC - 3 acres

Renovate 3, Habitat, Clearcast, Glyphosate - 4 acres

#### **Rate of control agents to be applied**

Fluridone - 0.125 gallons per acre.

Habitat – 0.250 – 0.750 gallons per acre.

Clearcast – 0.500 – 0.750 gallons per acre.

Glyphosate - up to 0.937 gallons per acre.

Renovate - 0.500 to 0.750 gallons per acre.

Clipper – up to 0.09375 gallons per acre

Galleon SC - 2 to 12 fl oz per acre.

#### **Method of application of control agents**

Fluridone, Galleon SC - Apply subsurface throughout lake

Glyphosate, Clipper, Renovate - Spray on surface of foliage with appropriate surfactant

#### **Timing and sequence of control application.**

Herbicides to be applied when plants are actively growing

#### **Other control application specifications**

None

#### **Entity to apply control agent**

Commercial applicator contracted and monitored by SCPRT.

#### **Estimated cost of control operations**

\$1,000

**Potential sources of funding**

S.C. Department of Parks, Recreation and Tourism 50%

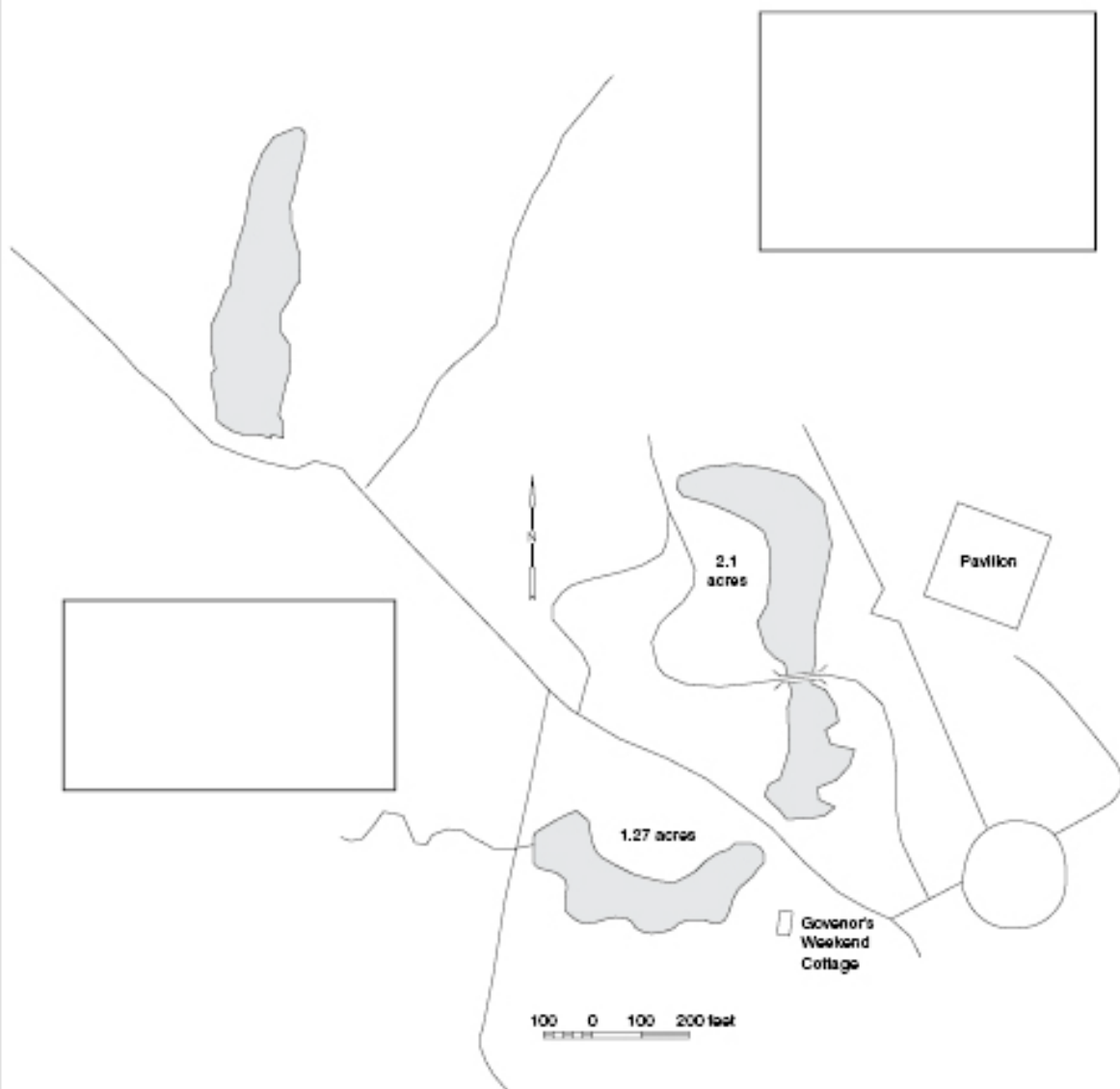
S.C. Department of Natural Resources 50% (up to \$30,000 cost share per waterbody)

(Percentage of match subject to change based on availability of Federal and State funding.)

**Long term management strategy**

- a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.
- c) Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.

## Charles Towne Landing State Park





### **34. Cheraw State Park (Lake Juniper) (Chesterfield County)**

#### **Problem plant species**

Floating heart, Waterlily, Spatterdock, Watermilfoil

#### **Management objective**

Reduce or remove problem plants to the extent they do not interfere with recreational opportunities.

#### **Selected control method**

Floating heart, Waterlily, Spatterdock, Watermilfoil – Renovate Max G

Floating heart, Spatterdock – Habitat, Glyphosate

#### **Area to which control is to be applied**

20 acres along boardwalk, main swimming area, and swimming areas at Camps Forest & Juniper

#### **Rate of control agent to be applied**

Renovate Max G – 200 lbs per acre.

Habitat – 0.500 – 0.750 gallons per acre.

Glyphosate – up to 0.937 gallons per acre.

#### **Method of application of control agent**

Foliar application using appropriate surfactant from airboat. Granular herbicides spread evenly using appropriate rate.

#### **Timing and sequence of control application**

Apply when plants are actively growing.

#### **Other control application specifications**

Monitor plant growth prior to treatment.

#### **Entity to apply control agent**

Commercial applicator contracted and monitored by SCPRT.

#### **Estimated cost of control operations**

\$12,000

#### **Potential sources of funding**

S.C. Department of Parks, Recreation and Tourism 50%

S.C. Department of Natural Resources 50% (up to \$30,000 cost share per waterbody)

(Percentage of match subject to change based on availability of Federal and State funding.)

#### **Long term management strategy**

- a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.
- c) Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.

### **35. Croft State Park (Spartanburg County)**

#### **Problem plant species**

Hydrilla

#### **Management objective**

Reduce or remove problem plants to the extent they do not interfere with recreational opportunities.

#### **Selected control method**

Hydrilla – Triploid Grass Carp

#### **Area to which control is to be applied**

50 acres

#### **Rate of control agent to be applied**

Triploid Grass Carp – 25 fish per vegetated acre

#### **Method of application of control agent**

Triploid grass carp – Using standard techniques to minimize loss, stock sterile grass carp in areas of the lake with the greatest hydrilla growth.

#### **Timing and sequence of control application**

Triploid grass carp to be released as soon as possible in the spring of 2013 (March-May).  
RESULTS FROM GRASS CARP MAY NOT BE EVIDENT FOR TWO OR MORE YEARS.

#### **Other control application specifications**

Treatment of the control area is to be conducted in a manner that will not significantly degrade water quality. This may require that only a portion of the control area be treated at any one time.

If available, all sterile grass carp will be a minimum of 12 inches in length. Sterile grass carp shipments will be certified by the SCDNR for sterility and checked for size and condition prior to stocking in the lake.

#### **Other control application specifications**

Monitor plant growth prior to treatment.

#### **Entity to apply control agent**

Commercial applicator contracted and monitored by SCPRT.

#### **Estimated cost of control operations**

\$12,000

**Potential sources of funding**

S.C. Department of Parks, Recreation and Tourism 50%

S.C. Department of Natural Resources 50% (up to \$30,000 cost share per waterbody)

(Percentage of match subject to change based on availability of Federal and State funding.)

**Long term management strategy**

- a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.
- c) Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.

### **36.H. Cooper Black State Recreation Area (Chesterfield County)**

#### **Problem plant species**

Waterlily, Watershield

#### **Management objective**

Reduce or remove problem plants to the extent they do not interfere with recreational opportunities.

#### **Selected control method**

Hardball, Habitat, Clearcast, Glyphosate

#### **Area to which control is to be applied**

2 acres in lake.

#### **Rate of control agent to be applied**

Habitat – 0.250 – 0.750 gallons per acre.  
Clearcast – 0.500 – 0.750 gallons per acre.  
Glyphosate - up to 0.937 gallons per acre.  
Hardball – up to 5 gallons per acre.

#### **Method of application of control agent**

Subsurface injection from airboat.

#### **Timing and sequence of control application**

Apply when plants are actively growing.

#### **Other control application specifications**

Monitor plant growth prior to treatment.

#### **Entity to apply control agent**

Commercial applicator contracted and monitored by SCPRT.

#### **Estimated cost of control operations**

\$375

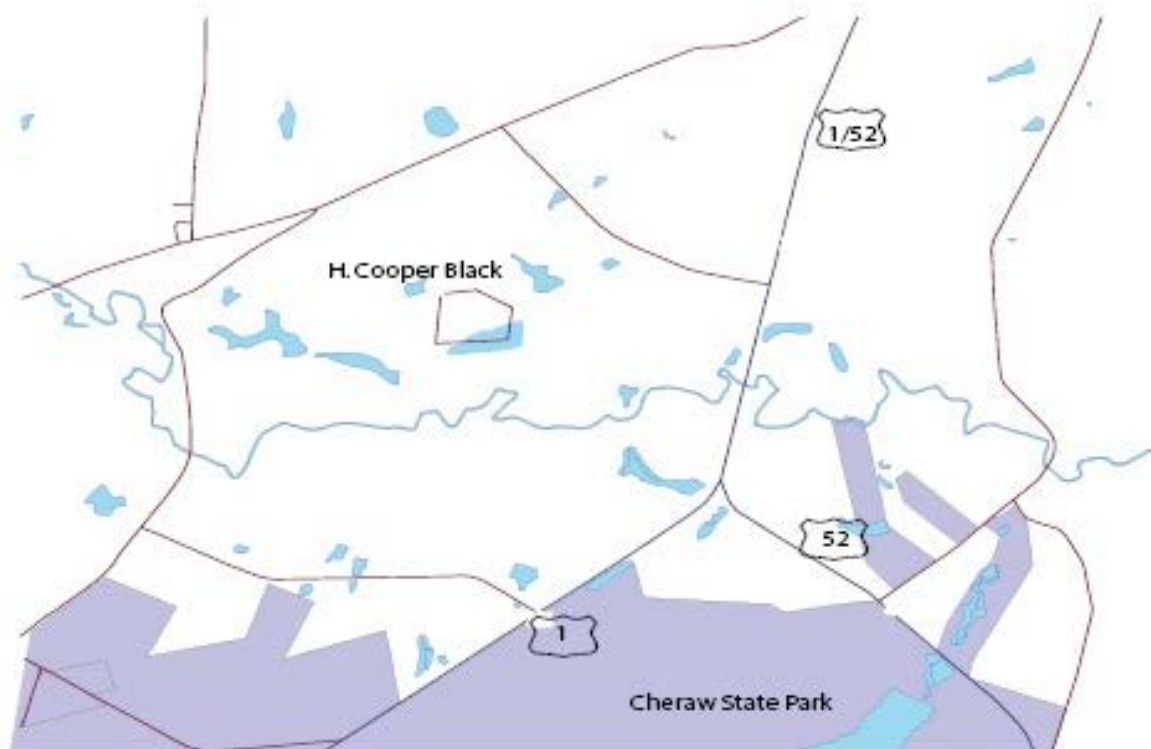
#### **Potential sources of funding**

S.C. Department of Parks, Recreation and Tourism 50%  
S.C. Department of Natural Resources 50% (up to \$30,000 cost share per waterbody)  
(Percentage of match subject to change based on availability of Federal and State funding.)

#### **Long term management strategy**

- a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.
- c) Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.

## H. Cooper Black Recreation Area



### **37. Hunting Island State Park (Beaufort County)**

#### **Problem plant species**

Duckweed

#### **Management objective**

Reduce or remove problem plants to the extent they do not interfere with recreational opportunities.

#### **Selected control method**

Fluridone, Clipper, Galleon SC

#### **Area to which control is to be applied**

2 acres adjacent to the parks use area

#### **Rate of control agent to be applied**

Fluridone - 0.125 gallons per acre.

Clipper – up to 0.09375 gallons per acre

Galleon SC - 2 to 12 fl oz per acre.

#### **Method of application of control agent**

Herbicide - Spray on surface of foliage with appropriate surfactant or subsurface injection broadcast evenly from airboat.

#### **Timing and sequence of control application**

Apply when plants are actively growing.

#### **Other control application specifications**

Monitor plant growth prior to treatment.

#### **Entity to apply control agent**

Commercial applicator contracted and monitored by SCPRT.

#### **Estimated cost of control operations**

\$1,200

#### **Potential sources of funding**

S.C. Department of Parks, Recreation and Tourism 50%

S.C. Department of Natural Resources 50% (up to \$30,000 cost share per waterbody)

(Percentage of match subject to change based on availability of Federal and State funding.)

#### **Long term management strategy**



- a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.
- c) Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.

### **38. Huntington Beach State Park (Georgetown County)**

#### **Problem plant species**

Phragmites, Cutgrass, Cattails

#### **Management objective**

Reduce or remove problem plants to the extent they do not interfere with recreational opportunities.

#### **Selected control method**

Habitat, Clearcast, Glyphosate

#### **Area to which control is to be applied**

10 acres in 3 different lakes.

#### **Rate of control agent to be applied**

Habitat - 0.500 – 0.750 gallons per acre.

Clearcast - 0.500 – 0.750 gallons per acre.

Glyphosate - up to 0.937 gallons per acre.

#### **Method of application of control agent**

Spray on surface of foliage with appropriate surfactant.

#### **Timing and sequence of control application**

Apply after plants are actively growing (May - Oct.).

#### **Other control application specifications**

Application to be conducted by airboat, ground, or helicopter. Phragmites control in impounded areas should only occur where drainage has left areas moderately dry

#### **Entity to apply control agent**

Commercial applicator

#### **Estimated cost of control operations**

\$1,100

#### **Potential sources of funding**

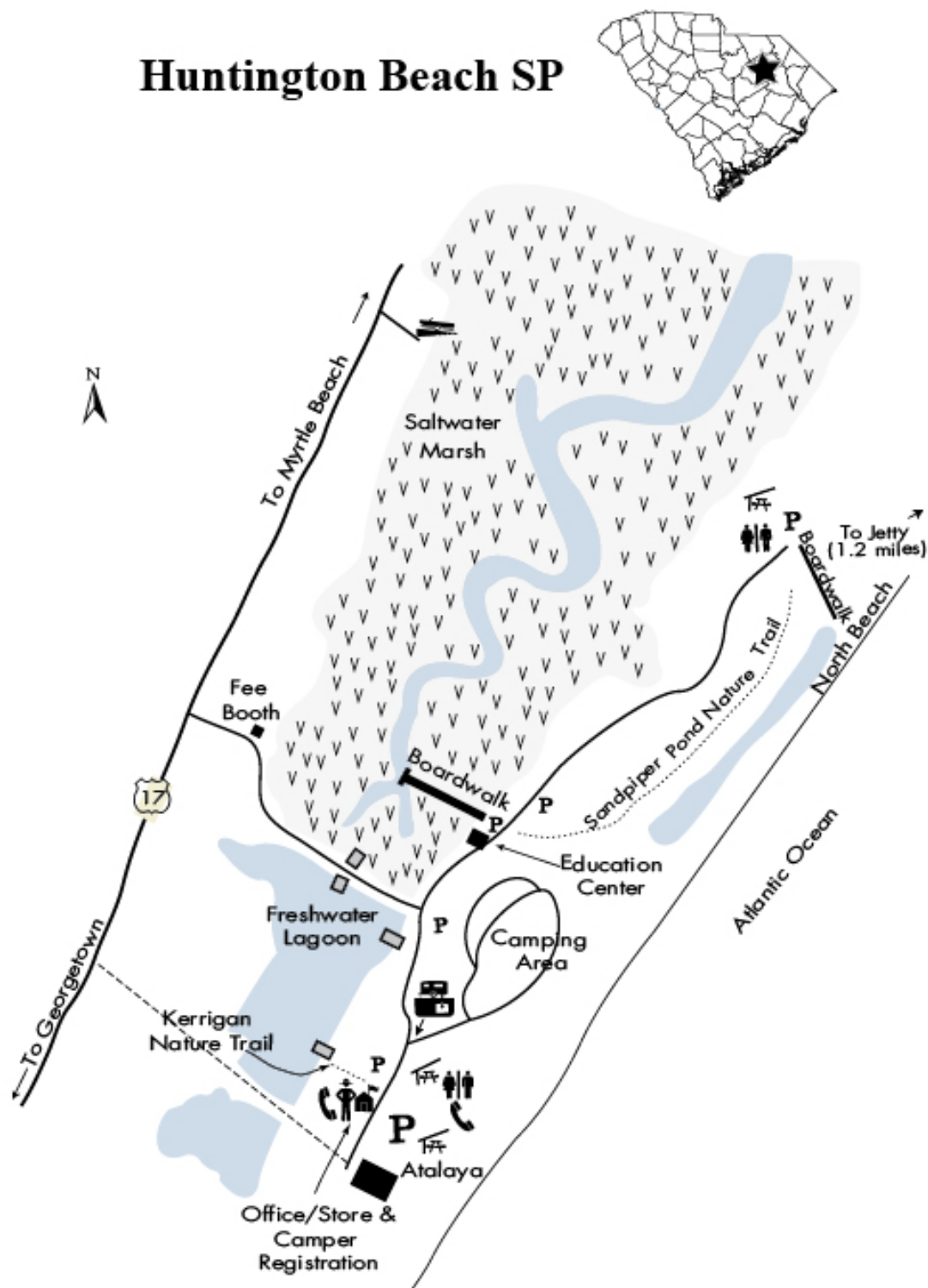
S.C. Department of Parks, Recreation and Tourism 50%

S.C. Department of Natural Resources 50% (up to \$30,000 cost share per waterbody)

#### **Long term management strategy**

- a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.
- c) Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.

# Huntington Beach SP



### **39. Jones Gap State Park (Greenville County)**

#### **Problem plant species**

Kudzu

#### **Management objective**

Reduce or remove problem plants to the extent they do not interfere with recreational opportunities.

#### **Selected control method**

Renovate 3, 2,4-D

#### **Area to which control is to be applied**

1 acre in marsh.

#### **Rate of control agent to be applied**

Renovate 3 – 0.500 gallons per acre.

2,4-D - 0.250 gallons per acre.

#### **Method of application of control agent**

Spray on surface of foliage with appropriate surfactant.

#### **Timing and sequence of control application**

Apply after plants are actively growing (May - Oct.).

#### **Other control application specifications**

Application to be conducted by ground, or helicopter.

#### **Entity to apply control agent**

Commercial applicator

#### **Estimated cost of control operations**

\$240

#### **Potential sources of funding**

S.C. Department of Parks, Recreation and Tourism 50%

S.C. Department of Natural Resources 50% (up to \$30,000 cost share per waterbody)

#### **Long term management strategy**

- a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.

- b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.
- c) Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.

#### **40. Kings Mountain State Park - Crawford Lake (York County)**

##### **Problem plant species**

Slender naiad

##### **Management objective**

Reduce or remove problem plants to the extent they do not interfere with recreational opportunities.

##### **Selected control method**

Aquathol K

##### **Area to which control is to be applied**

4 acres in swimming and paddle boat area

##### **Rate of control agent to be applied**

Four (4) gallons per acre.

##### **Method of application of control agent**

Apply subsurface throughout lake

##### **Timing and sequence of control application**

Apply in May or June when naiad growth is initiated.

##### **Other control application specifications**

Monitor plant growth prior to treatment.

##### **Entity to apply control agent**

Commercial applicator contracted and monitored by SCPRT.

##### **Estimated cost of control operations**

\$1,050

##### **Potential sources of funding**

S.C. Department of Parks, Recreation and Tourism 50%

S.C. Department of Natural Resources 50% (up to \$30,000 cost share per waterbody)

(Percentage of match subject to change based on availability of Federal and State funding.)

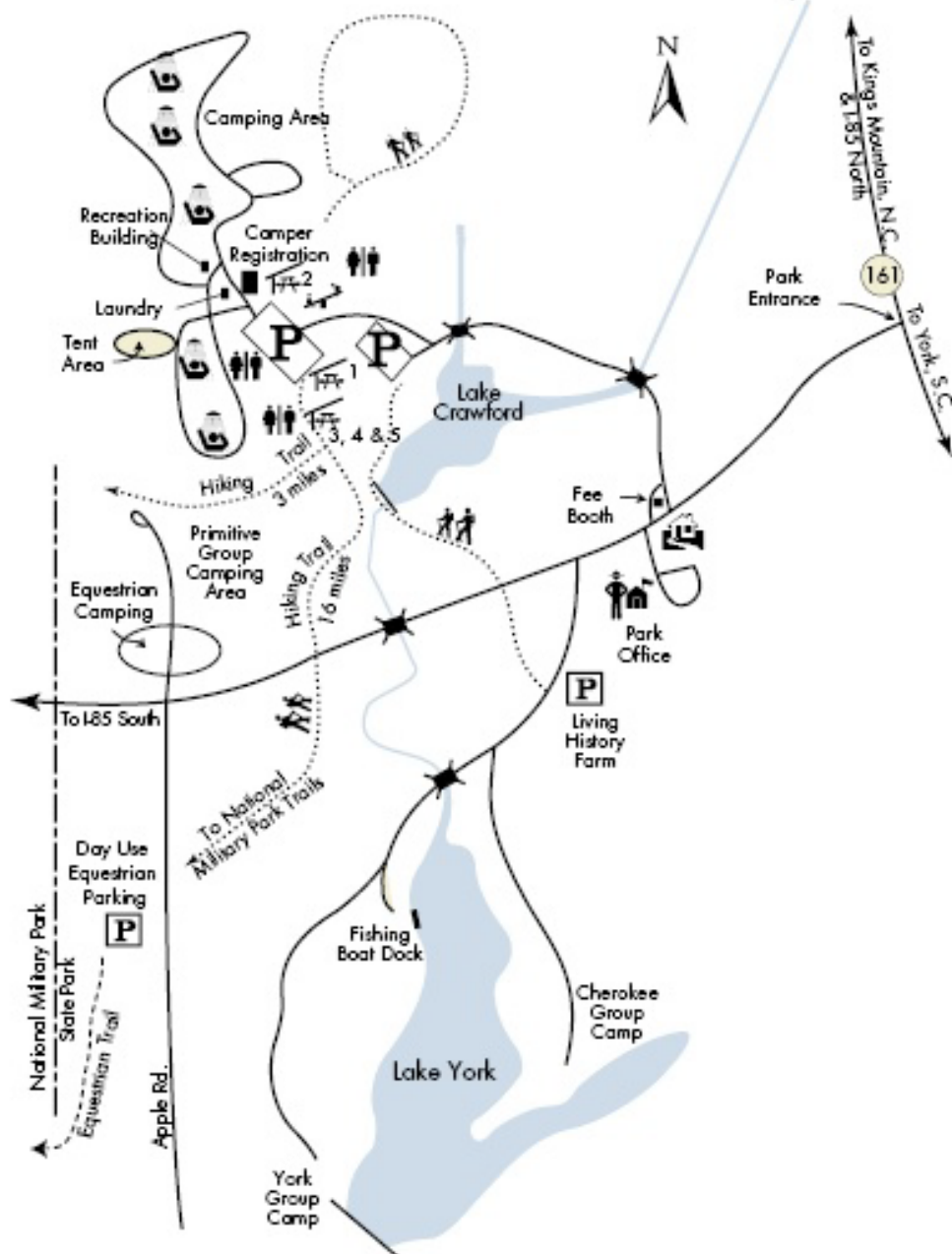
##### **Long term management strategy**

- a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.

- b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.
- c) Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.



# Kings Mountain SP Lake Crawford



#### **41. Lee State Park (Lee County)**

**Problem plant species**

Watermilfoil

**Management objective**

Reduce or remove problem plants to the extent they do not interfere with recreational opportunities.

**Selected control method**

Renovate Max G,

**Area to which control is to be applied**

3 acres adjacent to the parks day use area, along the park dam and adjacent to the campground

**Rate of control agent to be applied**

Renovate Max G - 200 lbs per acre.

**Method of application of control agent**

Herbicide - Spray on surface of foliage with appropriate surfactant. Granular broadcast evenly from airboat.

**Timing and sequence of control application**

Apply when plants are actively growing.

**Other control application specifications**

Monitor plant growth prior to treatment.

**Entity to apply control agent**

Commercial applicator contracted and monitored by SCPRT.

**Estimated cost of control operations**

\$1,810

**Potential sources of funding**

S.C. Department of Parks, Recreation and Tourism 50%

S.C. Department of Natural Resources 50% (up to \$30,000 cost share per waterbody)

(Percentage of match subject to change based on availability of Federal and State funding.)

**Long term management strategy**

- d) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.

- e) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.
- f) Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.

## **42. Little Pee Dee State Park (Dillon County)**

### **Problem plant species**

Spatterdock, Spatterdock, Water lily, Watershield,

### **Management objective**

Reduce or remove problem plants to the extent they do not interfere with recreational opportunities.

### **Selected control method**

Renovate Max G, Clearcast, Glyphosate, Habitat

### **Area to which control is to be applied**

10 acres adjacent to the parks day use area, along the park dam and adjacent to the campground

### **Rate of control agent to be applied**

Renovate Max G - 200 lbs per acre.  
Clearcast – 0.500 – 0.750 gallons per acre.  
Habitat - 0.500 – 0.750 gallons per acre.  
Glyphosate – up to 0.937 gallons per acre.

### **Method of application of control agent**

Herbicide - Spray on surface of foliage with appropriate surfactant. Granular broadcast evenly from airboat.

### **Timing and sequence of control application**

Apply when plants are actively growing.

### **Other control application specifications**

Monitor plant growth prior to treatment.

### **Entity to apply control agent**

Commercial applicator contracted and monitored by SCPRT.

### **Estimated cost of control operations**

\$3,000

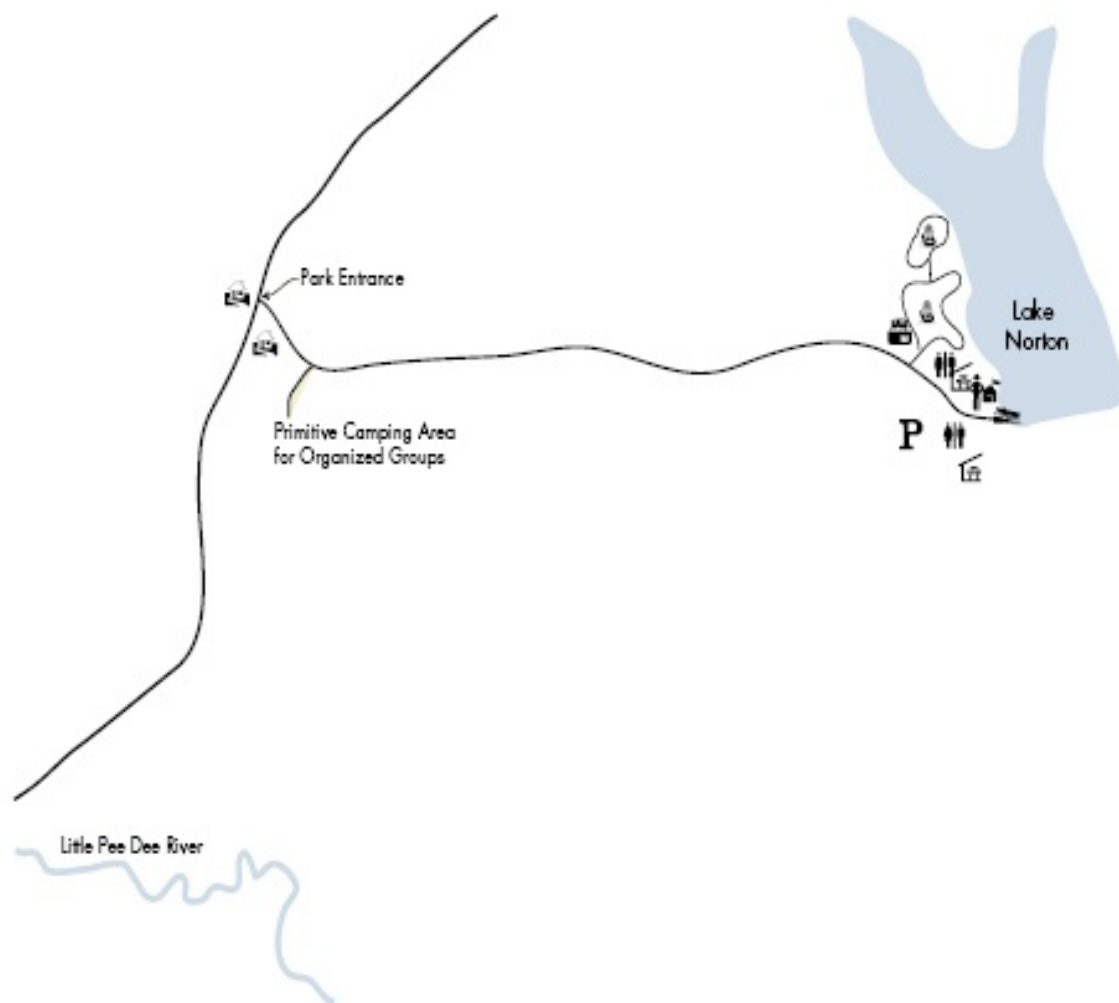
### **Potential sources of funding**

S.C. Department of Parks, Recreation and Tourism 50%  
S.C. Department of Natural Resources 50% (up to \$30,000 cost share per waterbody)  
(Percentage of match subject to change based on availability of Federal and State funding.)

### **Long term management strategy**

- a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.
- c) Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.

# Little Pee Dee SP Lake Norton



### **43.N.R. Goodale State Park (Kershaw County)**

#### **Problem plant species**

Waterlily, Watershield

#### **Management objective**

Reduce or remove problem plants to the extent they do not interfere with recreational opportunities.

#### **Selected control method**

Hardball, Renovate Max G

#### **Area to which control is to be applied**

5 acres in lake.

#### **Rate of control agent to be applied**

Hardball - Up to 5 gallons per acre.  
Renovate Max G – 200 lbs per acre.

#### **Method of application of control agent**

Herbicide - Spray on surface of foliage with appropriate surfactant. Granular broadcast evenly from airboat.

#### **Timing and sequence of control application**

Apply when plants are actively growing.

#### **Other control application specifications**

Monitor plant growth prior to treatment.

#### **Entity to apply control agent**

Commercial applicator contracted and monitored by SCPRT.

#### **Estimated cost of control operations**

\$3,000

#### **Potential sources of funding**

S.C. Department of Parks, Recreation and Tourism 50%

S.C. Department of Natural Resources 50% (up to \$30,000 cost share per waterbody)

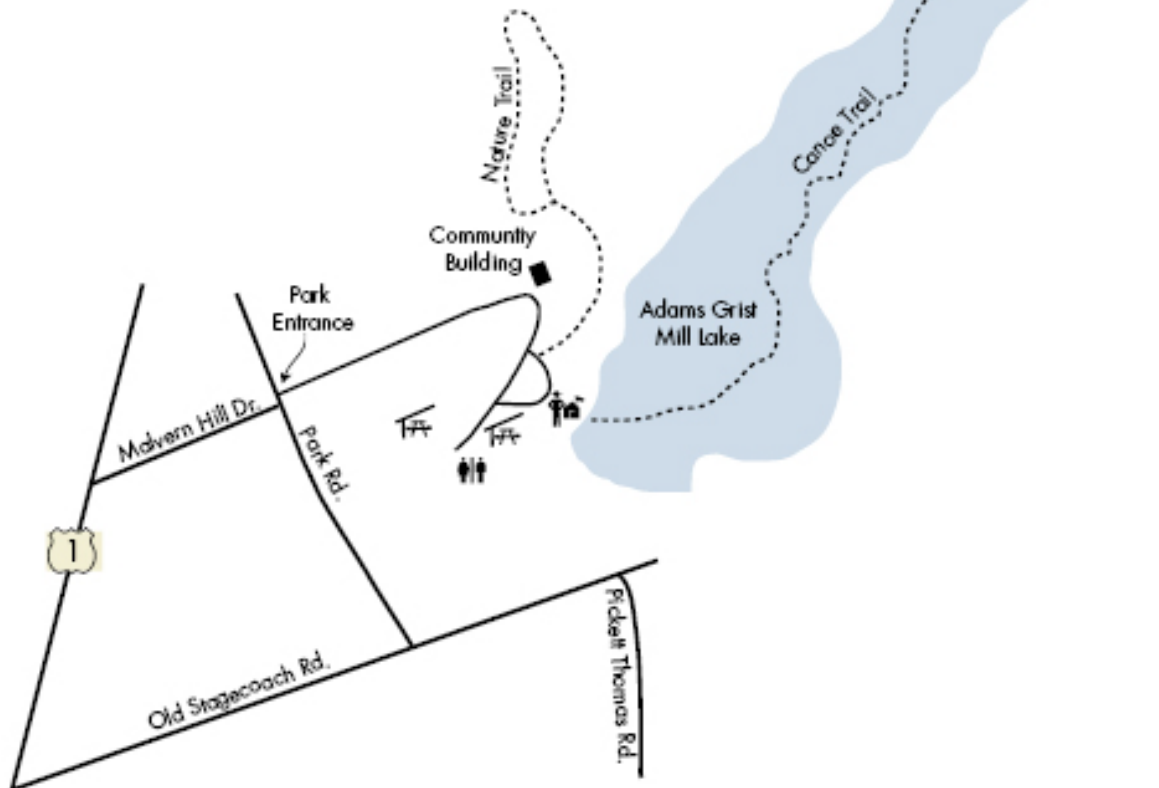
(Percentage of match subject to change based on availability of Federal and State funding.)

#### **Long term management strategy**

- a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.
- c) Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.



# N.R. Goodale State Park



#### **44. Paris Mountain State Park (Greenville County)**

##### **Problem plant species**

Slender Naiad, Watershield,

##### **Management objective**

Reduce or remove problem plants to the extent they do not interfere with recreational opportunities.

##### **Selected control method**

Renovate Max G, Clearcast, Glyphosate, Habitat

##### **Area to which control is to be applied**

Lake Placid: slender naiad 5 acres - Treat with grass carp

Lake Buckhorn: Watershield, pondweed treat 1 acre

##### **Rate of control agent to be applied**

Triploid Grass Carp – 15 fish per vegetated acre

Renovate Max G - 200 lbs per acre.

##### **Method of application of control agent**

Triploid grass carp – Using standard techniques to minimize loss, stock sterile grass carp in areas of the lake with the greatest hydrilla growth.

Herbicide - Spray on surface of foliage with appropriate surfactant. Granular broadcast evenly from airboat.

##### **Timing and sequence of control application**

Triploid grass carp to be released as soon as possible in the spring of 2013 (March-May).

RESULTS FROM GRASS CARP MAY NOT BE EVIDENT FOR TWO OR MORE YEARS.

Herbicide - Apply when plants are actively growing.

##### **Other control application specifications**

Monitor plant growth prior to treatment. Treatment of the control area is to be conducted in a manner that will not significantly degrade water quality. This may require that only a portion of the control area be treated at any one time.

If available, all sterile grass carp will be a minimum of 12 inches in length. Sterile grass carp shipments will be certified by the SCDNR for sterility and checked for size and condition prior to stocking in the lake.

##### **Entity to apply control agent**

Commercial applicator contracted and monitored by SCPRT.

##### **Estimated cost of control operations**

\$1,300

**Potential sources of funding**

S.C. Department of Parks, Recreation and Tourism 50%

S.C. Department of Natural Resources 50% (up to \$30,000 cost share per waterbody)

(Percentage of match subject to change based on availability of Federal and State funding.)

**Long term management strategy**

- a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.
- c) Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.

## **45. Poinsett State Park (Sumter County)**

### **Problem plant species**

Spatterdock, Cattails

### **Management objective**

Reduce or remove problem plants to the extent they do not interfere with recreational opportunities.

### **Selected control method**

Habitat, Glyphosate, Clearcast, Renovate Max G

### **Area to which control is to be applied**

5 acres in swimming and bank fishing portions of the lake.

### **Rate of control agent to be applied**

Clearcast - Up to 1 gallon per acre.

Habitat - Up to 0.750 gallons per acre.

Glyphosate - Up to 0.750 gallons per acre.

Renovate Max G – 200 lbs per acre.

### **Method of application of control agent**

Herbicide - Spray on surface of foliage with appropriate surfactant. Granular broadcast evenly from airboat.

### **Timing and sequence of control application**

Apply when plants are actively growing.

### **Other control application specifications**

Monitor plant growth prior to treatment.

### **Entity to apply control agent**

Commercial applicator contracted and monitored by SCPRT.

### **Estimated cost of control operations**

\$1,500

### **Potential sources of funding**

S.C. Department of Parks, Recreation and Tourism 50%

S.C. Department of Natural Resources 50% (up to \$30,000 cost share per waterbody)

(Percentage of match subject to change based on availability of Federal and State funding.)

### **Long term management strategy**

- a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.
- c) Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.

#### **46. Sesquicentennial State Park (Richland County)**

##### **Problem plant species**

Waterlily, Watershield

##### **Management objective**

Reduce or remove problem plants to the extent they do not interfere with recreational opportunities.

##### **Selected control method**

Hardball, Renovate Max G

##### **Area to which control is to be applied**

5 acres in swimming and bank fishing portions of the lake.

##### **Rate of control agent to be applied**

Hardball - Up to 5 gallons per acre.  
Renovate Max G – 200 lbs per acre.

##### **Method of application of control agent**

Herbicide - Spray on surface of foliage with appropriate surfactant. Granular broadcast evenly from airboat.

##### **Timing and sequence of control application**

Apply when plants are actively growing.

##### **Other control application specifications**

Monitor plant growth prior to treatment.

##### **Entity to apply control agent**

Commercial applicator contracted and monitored by SCPRT.

##### **Estimated cost of control operations**

\$3,000

##### **Potential sources of funding**

S.C. Department of Parks, Recreation and Tourism 50%

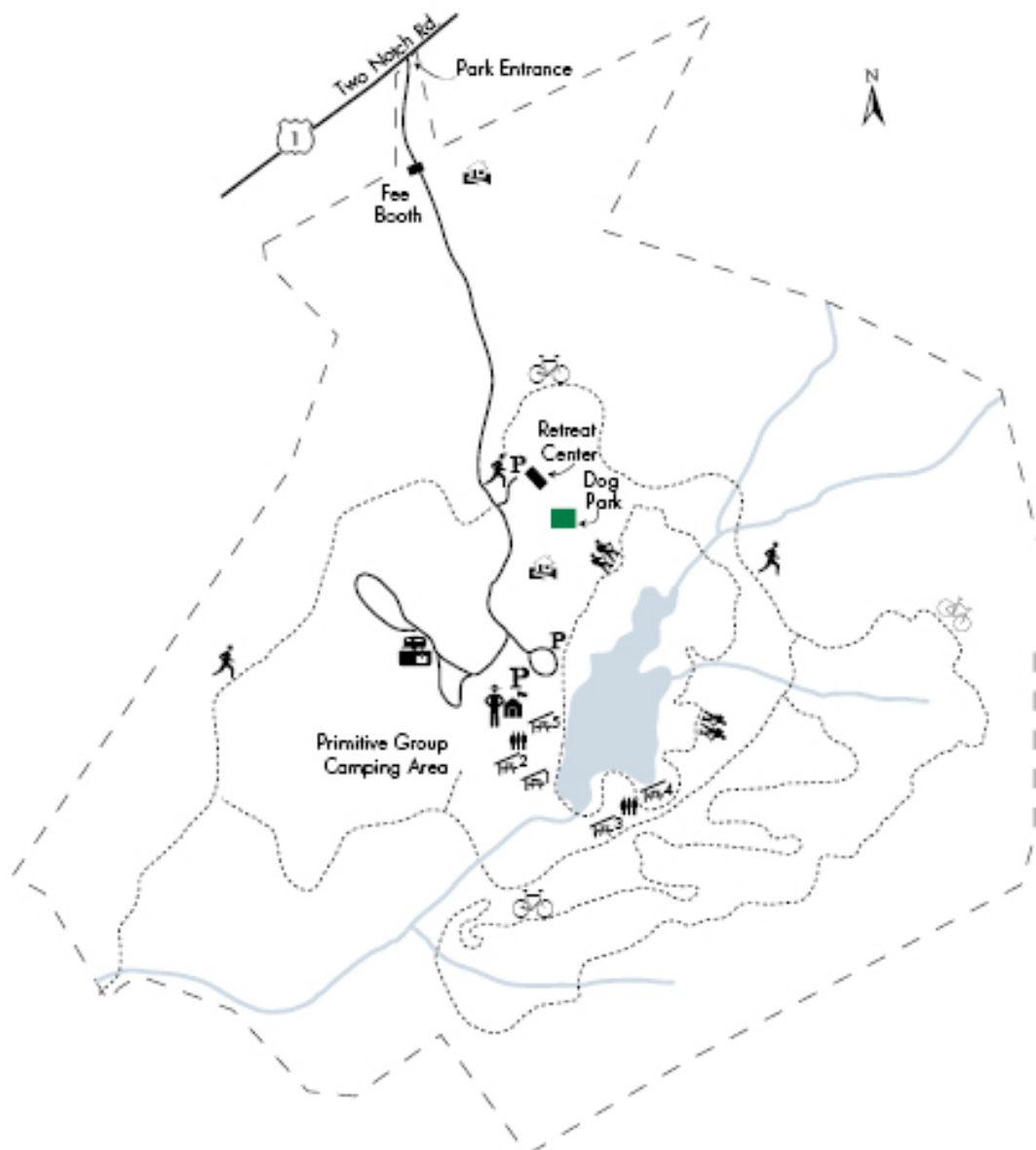
S.C. Department of Natural Resources 50% (up to \$30,000 cost share per waterbody)

(Percentage of match subject to change based on availability of Federal and State funding.)

##### **Long term management strategy**

- a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.
- c) Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.

# Sesquicentennial State Park





## South Carolina Department of Natural Resources

### State Lakes

\*Total price and cost share is for herbicide costs only based on state contract costs. Freshwater Fisheries staff will apply based on label rates.

#### 47. Lake Cherokee (Cherokee County)

##### **Problem plant species**

Water primrose

##### **Management objective**

Reduce or remove problem plants to the extent they do not interfere with recreational opportunities.

##### **Selected control method**

Renovate 3

##### **Area to which control is to be applied**

5 acres in lake, two (2) times per year.

##### **Rate of control agent to be applied**

Renovate 3 - 0.500 - 0.750 gallons per acre.

##### **Method of application of control agent**

Spray on surface of foliage with appropriate surfactant

##### **Timing and sequence of control application**

Apply when plants are actively growing.

##### **Other control application specifications**

Monitor plant growth prior to treatment.

##### **Entity to apply control agent**

SCDNR-Wildlife and Freshwater Fisheries Division, Lake Management staff.

##### **Estimated cost of control operations**

\$\*

##### **Potential sources of funding**

S.C. Department of Natural Resources (WFF division) 100%

U.S. Army Corps of Engineers 0%

S.C. Department of Natural Resources 0%

(Percentage of match subject to change based on availability of Federal and State funding.)

**Long term management strategy**

- a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.
- c) Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.

**48. Lake Edwin Johnson  
(Spartanburg County)**

**Problem plant species**

Water primrose, Hydrilla, Pondweed

**Management objective**

Reduce or remove problem plants to the extent they do not interfere with recreational opportunities.

**Selected control method**

Problems species	Control Agent
Water Primrose	Renovate 3
Pondweed	Komeen/Reward
Hydrilla	Triploid Grass Carp, Komeen/Reward

**Rate of control agent to be applied**

Renovate 3 - 0.500 - 0 gallons per acre.

Komeen/Reward - 4 gallons per acre / 2 gallons per acre.

Triploid Grass Carp – 25 fish per vegetated acre.

**Area to which control is to be applied**

Primrose - 7 acres in lake two (2) times per year.

Hydrilla/Pondweed - 4 acres in lake two (2) times per year.

If conditions warrant, release triploid grass carp in close proximity to areas of the lake with the greatest problematic growth and use herbicide applications to provide immediate short-term control of localized growth in those areas. 100 Triploid Carp

**Method of application of control agent**

Spray on surface of foliage with appropriate surfactant. Triploid grass carp – Using standard techniques to minimize loss, stock sterile grass carp in areas of the lake with the greatest hydrilla growth.

**Timing and sequence of control application**

Apply when plants are actively growing.

Triploid grass carp – If conditions warrant, triploid grass carp to be released as soon as possible.

**Other control application specifications**

Treatment of the control area is to be conducted in a manner that will not significantly degrade water quality. This may require that only a portion of the control area be treated at any one time.

If available, all sterile grass carp will be a minimum of 12 inches in length. Sterile grass carp shipments will be certified by the SCDNR for sterility and checked for size and condition prior to stocking in the lake.

**Entity to apply control agent**

Herbicide application – SCDNR Wildlife and Freshwater Fisheries Division, Lake Management staff and/or commercial applicator.

Triploid Grass Carp - SCDNR Wildlife and Freshwater Fisheries Division, Lake Management staff and/or a commercial supplier with supervision by the SCDNR.

**Estimated cost of control operations**

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**Potential sources of funding**

S.C. Department of Natural Resources (WFF division) 100%

U.S. Army Corps of Engineers 0%

S.C. Department of Natural Resources 0%

(Percentage of match subject to change based on availability of Federal and State funding.)

**Long term management strategy**

- a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.

- c) Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.

#### **49. Jonesville Reservoir (Union County)**

##### **Problem plant species**

Water primrose, Pondweed

##### **Management objective**

Reduce or remove problem plants to the extent they do not interfere with recreational opportunities.

##### **Selected control method**

Renovate 3, Glyphosate

##### **Area to which control is to be applied**

10 acres in lake.

##### **Rate of control agent to be applied**

Renovate 3 - 0.500 – 0.750 gallons per acre.

Glyphosate - up to 0.937 gallons per acre.

##### **Method of application of control agent**

Spray on surface of foliage with appropriate surfactant

##### **Timing and sequence of control application**

Apply when plants are actively growing.

##### **Other control application specifications**

Monitor plant growth prior to treatment.

##### **Entity to apply control agent**

SCDNR-Wildlife and Freshwater Fisheries Division, Lake Management staff.

##### **Estimated cost of control operations**

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##### **Potential sources of funding**

S.C. Department of Natural Resources (WFF division) 100%

U.S. Army Corps of Engineers 0%

S.C. Department of Natural Resources 0%

(Percentage of match subject to change based on availability of Federal and State funding.)

**Long term management strategy**

- a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.
- c) Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.

**50. Mountain Lakes  
(Chester County)**

**Problem plant species**

Water primrose, Alligatorweed, Parrotfeather

**Management objective**

Reduce or remove problem plants to the extent they do not interfere with recreational opportunities.

**Selected control method**

Renovate 3, Glyphosate

**Area to which control is to be applied**

5 acres in lake.

**Rate of control agent to be applied**

Renovate 3 - 0.500 - 0.750 gallons per acre.

Glyphosate - up to 0.937 gallons per acre.

**Method of application of control agent**

Spray on surface of foliage with appropriate surfactant

**Timing and sequence of control application**

Apply when plants are actively growing.

**Other control application specifications**

Monitor plant growth prior to treatment.

**Entity to apply control agent**

SCDNR-Wildlife and Freshwater Fisheries Division, Lake Management staff.

**Estimated cost of control operations**

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**Potential sources of funding**

S.C. Department of Natural Resources (WFF division) 100%

U.S. Army Corps of Engineers 0%

S.C. Department of Natural Resources 0%

(Percentage of match subject to change based on availability of Federal and State funding.)

**Long term management strategy**

- a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.
- c) Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.

## **51. Lancaster Reservoir (Lancaster County)**

**Problem plant species**

Water primrose, Alligatorweed

**Management objective**

Reduce or remove problem plants to the extent they do not interfere with recreational opportunities.

**Selected control method**

Renovate 3, Glyphosate

**Area to which control is to be applied**

8 acres in lake.

**Rate of control agent to be applied**

Renovate 3 - 0.500 - 0.750 gallons per acre.

Glyphosate - up to 0.937 gallons per acre.

**Method of application of control agent**

Spray on surface of foliage with appropriate surfactant

**Timing and sequence of control application**

Apply when plants are actively growing.

**Other control application specifications**

Monitor plant growth prior to treatment.

**Entity to apply control agent**

SCDNR-Wildlife and Freshwater Fisheries Division, Lake Management staff.

**Estimated cost of control operations**

\$\*

**Potential sources of funding**

S.C. Department of Natural Resources (WFF division) 100%

U.S. Army Corps of Engineers 0%

S.C. Department of Natural Resources 0%

(Percentage of match subject to change based on availability of Federal and State funding.)

**Long term management strategy**

- a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.
- c) Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.

## **52. Sunrise Lake (Lancaster County)**

**Problem plant species**

Pondweed

**Management objective**

Reduce or remove problem plants to the extent they do not interfere with recreational opportunities.

**Selected control method**

Glyphosate

**Area to which control is to be applied**

15 acres in lake.

**Rate of control agent to be applied**

Glyphosate - up to 0.937 gallons per acre.

**Method of application of control agent**

Spray on surface of foliage with appropriate surfactant

**Timing and sequence of control application**

Apply when plants are actively growing.

**Other control application specifications**

Monitor plant growth prior to treatment.

**Entity to apply control agent**

SCDNR-Wildlife and Freshwater Fisheries Division, Lake Management staff.

**Estimated cost of control operations**

\$\*

**Potential sources of funding**

S.C. Department of Natural Resources (WFF division) 100%

U.S. Army Corps of Engineers 0%

S.C. Department of Natural Resources 0%

(Percentage of match subject to change based on availability of Federal and State funding.)

**Long term management strategy**

- a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.



- c) Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.

### **53. Lake Ashwood (Lee County)**

#### **Problem plant species**

Waterlily

#### **Management objective**

Reduce or remove problem plants to the extent they do not interfere with recreational opportunities.

#### **Selected control method**

Renovate Max G

#### **Area to which control is to be applied**

<5 acres of spotty coverage

#### **Rate of control agent to be applied**

200 pounds per acre

#### **Method of application of control agent**

Spray on surface of foliage with appropriate surfactant

#### **Timing and sequence of control application**

Apply when plants are actively growing.

#### **Other control application specifications**

Monitor plant growth prior to treatment.

#### **Entity to apply control agent**

SCDNR-Wildlife and Freshwater Fisheries Division, Lake Management staff.

#### **Estimated cost of control operations**

\$\*

#### **Potential sources of funding**

S.C. Department of Natural Resources (WFF division) 100%

U.S. Army Corps of Engineers 0%

S.C. Department of Natural Resources 0%

(Percentage of match subject to change based on availability of Federal and State funding.)

**Long term management strategy**

- a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.
- c) Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.

**54. Lake Edgar Brown  
(Barnwell County)****Problem plant species**

Water primrose, Coontail, water hyacinth

**Management objective**

Reduce or remove problem plants to the extent they do not interfere with recreational opportunities. Control efforts will extend into the Turkey Creek area adjacent to the Barnwell Hatchery.

**Selected control method**

Habitat, Glyphosate

**Area to which control is to be applied**

60 acres in lake.

**Rate of control agent to be applied**

Habitat - up to 0.750 gallons per acre.

Glyphosate - up to 0.937 gallons per acre.

**Method of application of control agent**

Spray on surface of foliage with appropriate surfactant

**Timing and sequence of control application**

Apply when plants are actively growing.

**Other control application specifications**

Monitor plant growth prior to treatment.

**Entity to apply control agent**

SCDNR-Wildlife and Freshwater Fisheries Division, Lake Management staff.

**Estimated cost of control operations**

\$\*

**Potential sources of funding**

S.C. Department of Natural Resources (WFF division) 100%

U.S. Army Corps of Engineers 0%

S.C. Department of Natural Resources 0%

(Percentage of match subject to change based on availability of Federal and State funding.)

**Long term management strategy**

- a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.
- c) Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.

## **55.Lake George Warren (Hampton County)**

**Problem plant species**

Water primrose, Cattails, Coontail, Naiad

**Management objective**

Reduce or remove problem plants to the extent they do not interfere with recreational opportunities.

**Selected control method**

Glyphosate, Habitat, Triploid Grass Carp

**Area to which control is to be applied**

20 acres in lake.

**Rate of control agent to be applied**

Glyphosate - up to 0.937 gallons per acre.

Habitat - 0.250 - 0.500 gals/ac

If conditions warrant, release triploid grass carp in close proximity to areas of the lake with the greatest problematic growth and use herbicide applications to provide immediate short-term control of localized growth in those areas.

**Method of application of control agent**

Spray on surface of foliage with appropriate surfactant. Triploid grass carp – Using standard techniques to minimize loss, stock sterile grass carp in areas of the lake with the greatest hydrilla growth.

**Timing and sequence of control application**

Apply when plants are actively growing.

Triploid grass carp – If conditions warrant, triploid grass carp to be released as soon as possible.

**Other control application specifications**

Treatment of the control area is to be conducted in a manner that will not significantly degrade water quality. This may require that only a portion of the control area be treated at any one time.

If available, all sterile grass carp will be a minimum of 12 inches in length. Sterile grass carp shipments will be certified by the SCDNR for sterility and checked for size and condition prior to stocking in the lake.

**Entity to apply control agent**

Herbicide application – SCDNR Wildlife and Freshwater Fisheries Division, Lake Management staff and/or commercial applicator.

Triploid Grass Carp - SCDNR Wildlife and Freshwater Fisheries Division, Lake Management staff and/or a commercial supplier with supervision by the SCDNR.

**Estimated cost of control operations**

\$\*

**Potential sources of funding**

S.C. Department of Natural Resources (WFF division) 100%

U.S. Army Corps of Engineers 0%

S.C. Department of Natural Resources 0%

(Percentage of match subject to change based on availability of Federal and State funding.)

**Long term management strategy**

- a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant

populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.

- c) Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.

## **56. Lake Thicketty (Cherokee County)**

### **Problem plant species**

Hydrilla

### **Management objective**

Reduce or remove problem plants to the extent they do not interfere with recreational opportunities.

### **Selected control method**

Hydrilla Triploid grass carp, chelated copper

### **Area to which control is to be applied**

5 acres in lake.

### **Rate of control agent to be applied**

Approximately 5 acres in priority areas such as, public access sites (boat ramps, piers, swimming areas, marinas) and residential shoreline areas. If conditions warrant, release triploid grass carp in close proximity to areas of the lake with the greatest hydrilla growth and use herbicide applications to provide immediate short-term control of localized growth in those areas. 20 fish per vegetated acre.

Chelated copper - up to 1 ppm Glyphosate- up to 1 gallon per acre.

### **Method of application of control agents**

Chelated copper- subsurface application by airboat.

Triploid grass carp – Using standard techniques to minimize loss, stock sterile grass carp in areas of the lake with the greatest hydrilla growth.

### **Timing and sequence of control application**

All herbicides to be applied when plants are actively growing.

Triploid grass carp – If conditions warrant, triploid grass carp to be released as soon as possible.

### **Other control application specifications**

Treatment of the control area is to be conducted in a manner that will not significantly degrade water quality. This may require that only a portion of the control area be treated at any one time.

If available, all sterile grass carp will be a minimum of 12 inches in length. Sterile grass carp shipments will be certified by the SCDNR for sterility and checked for size and condition prior to stocking in the lake.

**Entity to apply control agent**

Herbicide application – SCDNR Wildlife and Freshwater Fisheries Division, Lake Management staff and/or commercial applicator.

Triploid Grass Carp - SCDNR Wildlife and Freshwater Fisheries Division, Lake Management staff and/or a commercial supplier with supervision by the SCDNR.

**Estimated cost of control operations**

\$\*

**Potential sources of funding**

S.C. Department of Natural Resources (WFF division) 100%

U.S. Army Corps of Engineers 0%

S.C. Department of Natural Resources 0%

(Percentage of match subject to change based on availability of Federal and State funding.)

**Long term management strategy**

- a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.
- c) Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.

## **57. Dargan's Pond (Darlington County)**

**Problem plant species**

Pondweed

**Management objective**

Reduce or remove problem plants to the extent they do not interfere with recreational opportunities.

**Selected control method**

Glyphosate, Triploid Grass Carp

**Area to which control is to be applied**

15 acres in lake.

**Rate of control agent to be applied**

Glyphosate - up to 0.937 gallons per acre.

Triploid Grass Carp – 25 fish per vegetated acre

**Method of application of control agents**

Glyphosate - subsurface application by airboat.

Triploid grass carp – Using standard techniques to minimize loss, stock sterile grass carp in areas of the lake with the greatest hydrilla growth.

**Timing and sequence of control application**

All herbicides to be applied when plants are actively growing.

Triploid grass carp – If conditions warrant, triploid grass carp to be released as soon as possible.

**Other control application specifications**

Treatment of the control area is to be conducted in a manner that will not significantly degrade water quality. This may require that only a portion of the control area be treated at any one time.

If available, all sterile grass carp will be a minimum of 12 inches in length. Sterile grass carp shipments will be certified by the SCDNR for sterility and checked for size and condition prior to stocking in the lake.

**Entity to apply control agent**

Herbicide application – SCDNR Wildlife and Freshwater Fisheries Division, Lake Management staff and/or commercial applicator.

Triploid Grass Carp - SCDNR Wildlife and Freshwater Fisheries Division, Lake Management staff and/or a commercial supplier with supervision by the SCDNR.

**Estimated cost of control operations**

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**Potential sources of funding**

S.C. Department of Natural Resources (WFF division) 100%

U.S. Army Corps of Engineers 0%

S.C. Department of Natural Resources 0%

(Percentage of match subject to change based on availability of Federal and State funding.)

**Long term management strategy**

- a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.
- c) Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.



## South Carolina Border Lakes

Approval for Lake Wylie was accomplished by SCDNR staff in conjunction with staff from North Carolina Natural Resource agencies, Duke Energy staff, and the Lake Wylie Marine Commission.

### 58. Lake Wylie

(York County, SC; Gaston and Mecklenburg County, NC)

#### **Problem plant species**

Hydrilla

#### **Management objective**

Reduce hydrilla growth lake-wide and prevent the spread of hydrilla to other systems.

Achieve measurable reduction of hydrilla within two or three years and once hydrilla has been controlled, prevent it from reestablishing.

Control hydrilla by using a low enough density of triploid grass carp that potentially other forms of native vegetation can become established.

#### **Selected control method**

Triploid (sterile) grass carp used lake wide for long-term control.

Registered and properly applied herbicides should be used for initial suppression and by home owners for spot treatments.

#### **Area to which control is to be applied**

Triploid grass carp will be released from boat ramps near the greatest concentration of hydrilla.

#### **Rate of control agent to be applied**

Recommendation for supplemental grass carp stocking in the spring of 2013. Because of the loss of sterile grass carp to mortality (disease, predation, fishing, bow hunting, etc.) we recommend 576 grass carp, be stocked in the lake during the spring of 2013. This is a supplemental stocking of 32% (average of national grass carp annual mortality curves, Phil Kirk pers com) of the original 1800 grass carp introduced in 2009. Duke Energy will continue to monitor the effectiveness of the introduced fish.

Triploid grass carp – Using standard techniques to minimize loss, stock sterile grass carp in areas of the lake with the greatest hydrilla growth.

#### **Method of application of control agents**

Herbicide- subsurface application by airboat.

Triploid grass carp – Using standard techniques to minimize loss, stock sterile grass carp in areas of the lake with the greatest hydrilla growth.

#### **Timing and sequence of control application**

Herbicide applications - To be applied when plants are actively growing.

Triploid grass carp to be released as soon as possible in the spring of 2013 (March-May) and yearly at the same time for at least the next three years. RESULTS FROM GRASS CARP MAY NOT BE EVIDENT FOR TWO OR MORE YEARS. After hydrilla has been controlled, follow up stocking, currently estimated at maintaining triploid grass carp stocking densities of approximately 1 fish per every 8 surface acres of Lake Wylie will be continued using mortality estimates derived from the population and population models.

#### **Other control application specifications**

Treatment of the control area is to be conducted in a manner that will not significantly degrade water quality. This may require that only a portion of the control area be treated at any one time.

Triploid grass carp will be a minimum of 12 inches total length. All shipments will be examined for condition and length specified in the contract with the vendor.

#### **Estimated cost of control operations**

All work to be done in North Carolina Section of the lake.

#### **Entity to apply control agent**

Herbicide application - Commercial applicator or Duke Power Company

Drawdown - Duke Power Company

#### **Potential sources of funding**

Duke Power Company 100% - All control work at present time is in North Carolina.

#### **Long term management strategy**

- a) Manage hydrilla's potential adverse impacts to the Lake Wylie ecosystem using primarily triploid grass carp after initial suppression using approved herbicides.
- b) Maintain or enhance native aquatic vegetation by maintaining the lowest possible stocking rates of triploid grass carp, especially once major stands of hydrilla have been controlled.
- c) Seek to prevent further introduction and distribution of problem aquatic species through public education and enforcement of existing laws and regulations.
- d) Periodically revise management plans and strategy as new environmental data becomes available.
- e) Plan for long-term control of hydrilla, once control has been achieved, by maintaining very low densities of triploid grass carp. Stockings will be determined from mortality estimates generated from triploid grass carp collected on Lake Wylie and the use of age-structure population models developed for fisheries.

## 59. Lake Thurmond

### (South Carolina - Georgia)

Lake Thurmond is a U.S. Army Corps of Engineers (USACOE) lake which borders South Carolina and Georgia. The control and maintenance issues associated with this lake fall under the jurisdiction of the USACOE. The USACOE coordinate with both Georgia and SC natural resource agencies on a variety of issues that effect natural resource management. A consensus has not been reached by the entities involved on management activities for invasive species, specifically hydrilla. Ongoing meetings and correspondence will continue on this and many other subjects.

**NOTE: The following description is not binding for management activities but represents the Aquatic Plant Management Council's opinion on managing hydrilla in Lake Thurmond.**

#### **Problem plant species**

Hydrilla

#### **Management objective**

Reduce hydrilla growth lake-wide and prevent the spread of hydrilla to other systems.

Achieve measurable reduction of hydrilla within two or three years and once hydrilla has been controlled, prevent it from reestablishing.

Control hydrilla by using a low enough density of triploid grass carp that potentially other forms of native vegetation can become established.

#### **Selected control method**

Triploid (sterile) grass carp used lake wide for long-term control.

Registered and properly applied herbicides should be used for initial suppression and by home owners for spot treatments.

#### **Area to which control is to be applied**

Triploid grass carp will be released from boat ramps near the greatest concentration of hydrilla.

#### **Rate of control agent to be applied**

Triploid grass carp – Using standard techniques to minimize loss, stock sterile grass carp in areas of the lake with the greatest hydrilla growth.

#### **Method of application of control agents**

Herbicide- subsurface application by airboat.

Triploid grass carp – Using standard techniques to minimize loss, stock sterile grass carp in areas of the lake with the greatest hydrilla growth.

#### **Timing and sequence of control application**

Herbicide applications - To be applied when plants are actively growing.

Triploid grass carp to be released as soon as possible. RESULTS FROM GRASS CARP MAY NOT BE EVIDENT FOR TWO OR MORE YEARS. After hydrilla has been controlled, follow up stocking,

currently estimated at maintaining triploid grass carp stocking densities of approximately 1 fish per every 8 surface acres of Lake Thurmond will be continued using mortality estimates derived from the population and population models.

**Other control application specifications**

Treatment of the control area is to be conducted in a manner that will not significantly degrade water quality. This may require that only a portion of the control area be treated at any one time.

Triploid grass carp will be a minimum of 12 inches total length. All shipments will be examined for condition and length specified in the contract with the vendor.

**Estimated cost of control operations**

**No estimate available**

**Entity to apply control agent**

Herbicide application - Commercial applicator or USACOE

Drawdown - USACOE

**Potential sources of funding**

USACOE 100%

**Long term management strategy**

- a) Manage hydrilla's potential adverse impacts to the Lake Thurmond ecosystem using primarily triploid grass carp after initial suppression using approved herbicides.
- b) Maintain or enhance native aquatic vegetation by maintaining the lowest possible stocking rates of triploid grass carp, especially once major stands of hydrilla have been controlled.
- c) Seek to prevent further introduction and distribution of problem aquatic species through public education and enforcement of existing laws and regulations.
- d) Periodically revise management plans and strategy as new environmental data becomes available.
- e) Plan for long-term control of hydrilla, once control has been achieved, by maintaining very low densities of triploid grass carp. Stockings will be determined from mortality estimates generated from triploid grass carp collected on Lake Thurmond and the use of age-structure population models developed for fisheries.

## **Additional Control Activities**

Control efforts for Island Applesnails, which costs are shouldered by SCDNR, will be conducted in Horry County **and Charleston County**. Herbicides based on the active ingredient Copper will be utilized. Product names include Natrix, Captain, and copper sulfate. Rates will be based on the lowest possible label rates published by the manufacturer.

### **Problem species**

Island Applesnail

### **Management objective**

Achieve measurable reduction of Island Applesnails within two or three years and once controlled, prevent them from reestablishing.

### **Selected control method**

Registered and properly applied herbicides should be used for initial suppression and for spot treatments.

### **Area to which control is to be applied**

Local ponds in Horry County near Socastee and in Charleston County near Mount Pleasant

### **Rate of control agent to be applied**

**Herbicide will be applied at the low end of the label rate.**

### **Method of application of control agents**

Herbicide- application by hand held sprayers of small boats.

### **Timing and sequence of control application**

Herbicide applications - To be applied when snails are actively growing.

### **Other control application specifications**

Treatment of the control area is to be conducted in a manner that will not significantly degrade water quality. This may require that only a portion of the control area be treated at any one time.

### **Estimated cost of control operations**

Costs may vary significantly

### **Entity to apply control agent**

Herbicide application - Commercial applicator or SCDNR

### **Potential sources of funding**

SCDNR 100%

### **Long term management strategy**

- a) Manage Island Applesnail's potential adverse impacts to the local ecosystem using approved herbicides. Prevent IAS from expanding its range into adjacent Waccamaw National Wildlife Refuge
- b) Seek to prevent further introduction and distribution of problem aquatic species through public education and enforcement of existing laws and regulations.
- c) Periodically revise management plans and strategy as new environmental data becomes available.

### Summary of Planned Management Operation Expenditures for 2013

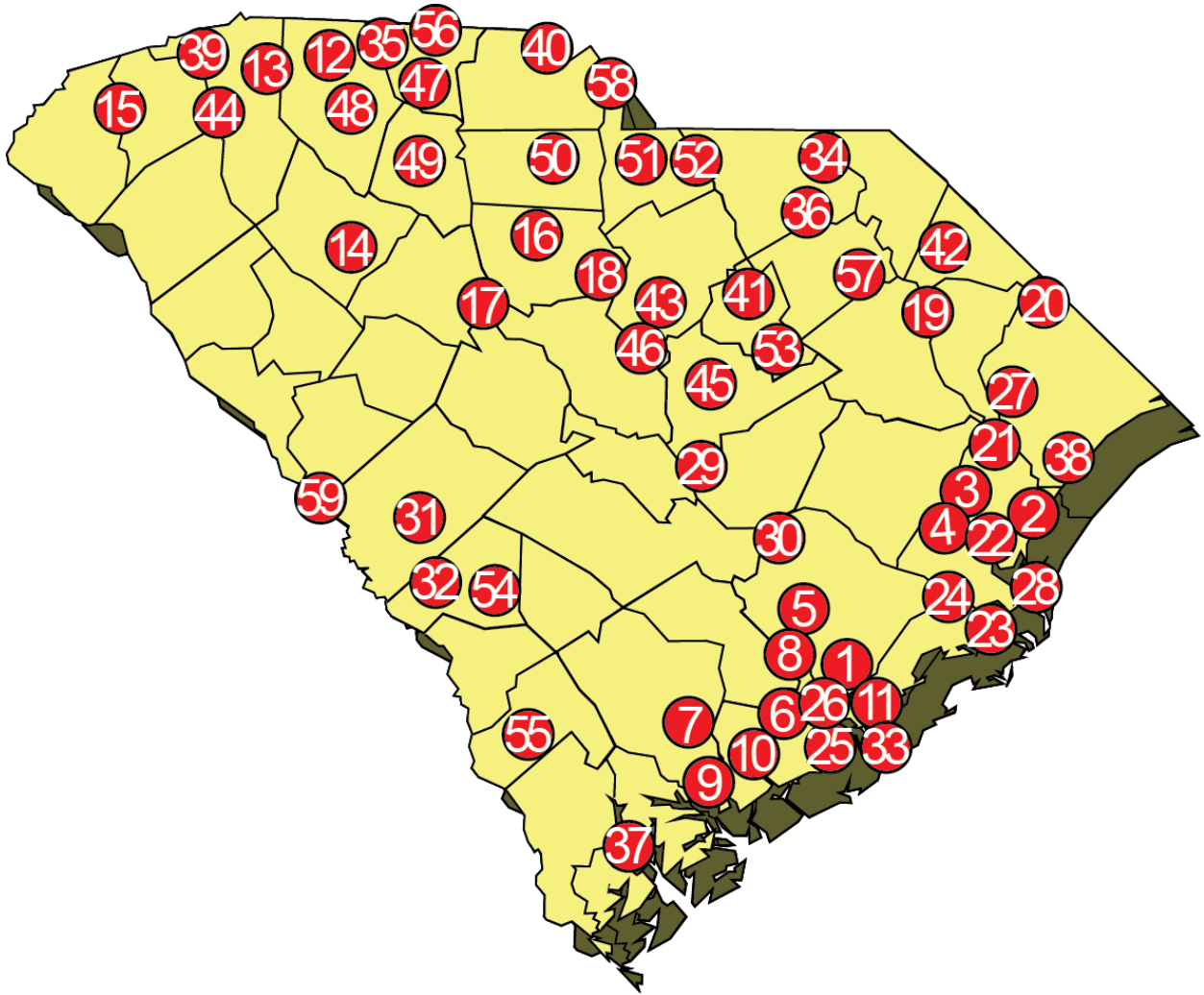
	Water Body Name	Total Cost	Local	State	Federal	Local Sponsor
1	Back River Reservoir	\$50,000	\$25,000	\$25,000	\$0	SCE&G, CPW
2	Baruch	\$3,000	\$1,500	\$1,500	\$0	Baruch
3	Black Mingo Creek	\$900	\$450	\$450	\$0	Georgetown Co.
4	Black River	\$3,250	\$1,625	\$1,625	\$0	Georgetown Co.
5	Bonneau Ferry WMA	\$5,750	\$2,875	\$2,875	\$0	SCDNR
6	Caw Caw Park	\$1,000	\$500	\$500	\$0	Charleston Parks
7	Combahee River	\$700	\$350	\$350	\$0	Colleton Co.
8	Cooper River	\$28,000	\$14,000	\$14,000	\$0	Berkeley Co.
9	Donnelley/ACE Basin	\$2,900	\$1,450	\$1,450	\$0	SCDNR,USF&W
10	Dungannon WMA	\$2,000	\$1,000	\$1,000	\$0	SCDNR, USF&W
11	Goose Creek Reservoir	\$34,500	\$17,250	\$17,250	\$0	CPW
12	Lake Bowen	\$1,600	\$800	\$800	\$0	Spartanburg CPW
13	Lake Cunningham	\$2,000	\$1,000	\$1,000	\$0	Greer CPW
14	Lake Greenwood	\$6,000	\$3,000	\$3,000	\$0	Greenwood Co.
15	Lake Keowee	\$0	\$0	\$0	\$0	Duke Energy
16	Lake Monticello(Rec. Lake)	\$6,000	\$3,000	\$3,000	\$0	SCE&G
17	Lake Murray	\$0	\$0	\$0	\$0	SCE&G, Lex. Co.
18	Lake Wateree	\$0	\$0	\$0	\$0	Duke Energy
19	Little Pee Dee River	\$1,500	\$750	\$750	\$0	Horry Co.
20	Lumber River	\$500	\$250	\$250	\$0	Horry Co.
21	Pee Dee River	\$5,500	\$2,750	\$2,750	\$0	Georgetown Co.
22	Samworth WMA	\$5,000	\$2,500	\$2,500	\$0	SCDNR
23	Santee Coastal Reserve	\$200	\$100	\$100	\$0	SCDNR
24	Santee Delta WMA	\$1,500	\$750	\$750	\$0	SCDNR
25	USACOE AICWW/Chas. Harbor	\$3,100	\$0	\$0	\$3,100	USACOE
26	US Naval Weapons Sta.	\$7,500	\$0	\$0	\$7,500	US Navy
27	Waccamaw River	\$4,000	\$2,000	\$2,000	\$0	USF&W/Horry Co.
28	Yawkey Wildlife Center	\$3,850	\$1,925	\$1,925	\$0	SCDNR
	Santee Cooper Lakes					
29	Lake Marion	\$900,000	\$900,000	\$0	\$0	Santee Cooper
30	Lake Moultrie	\$300,000	\$300,000	\$0	\$0	Santee Cooper
	State Parks					
31	Aiken State Park	\$6,000	\$3,000	\$3,000	\$0	SCPRT
32	Barnwell SP	\$6,000	\$3,000	\$3,000	\$0	SCPRT
33	Charlestown Landing SP	\$1,000	\$500	\$500	\$0	SCPRT
34	Cheraw SP	\$12,000	\$6,000	\$6,000	\$0	SCPRT
35	Croft SP	\$10,000	\$5,000	\$5,000	\$0	SCPRT
36	H Cooper Black SP	\$375	\$188	\$188	\$0	SCPRT

37	Hunting Island SP	\$1,200	\$600	\$600	\$0	SCPRT
38	Huntington Beach SP	\$1,100	\$550	\$550	\$0	SCPRT
39	Jones Gap SP	\$240	\$120	\$120	\$0	SCPRT
40	Kings Mountain SP	\$1,050	\$525	\$525	\$0	SCPRT
41	Lee SP	\$1,810	\$905	\$905	\$0	SCPRT
42	Little Pee Dee SP	\$3,000	\$1,500	\$1,500	\$0	SCPRT
43	NR Goodale	\$3,000	\$1,500	\$1,500	\$0	SCPRT
44	Paris Mountain SP	\$1,500	\$750	\$750	\$0	SCPRT
45	Poinsett SP	\$1,500	\$750	\$750	\$0	SCPRT
46	Sesquicentennial SP	\$3,000	\$1,500	\$1,500	\$0	SCPRT
*	47-57 done entirely by SCDNR State Lakes Program, budget not provided					
	SCDNR Total	\$186,250	\$87,825	\$87,825	\$10,600	
	State Park Lake Total	\$52,776	\$26,388	\$26,388	\$0	
	Santee Cooper Total	\$1,200,000	\$1,140,000	\$60,000	\$0	
	<b>SCDNR/State Parks Total</b>	<b>\$239,026</b>	<b>\$114,213</b>	<b>\$114,213</b>	<b>\$10,600</b>	
	<b>Grand Total</b>	<b>\$1,439,026</b>	<b>\$1,254,213</b>	<b>\$174,213</b>	<b>\$10,600</b>	

NOTE: Planned expenditures are based on anticipated aquatic plant problems. The extent of proposed management operations will be modified depending on actual aquatic plant growth and funding availability in 2013 (Percentage of match subject to change based on availability of Federal and State funding.) \* Control operations on Lakes Marion and Moultrie may receive federal funds from the Corps of Engineers St. Stephen Plant if control activities are directly related to maintaining operation of the St. Stephen Hydropower Facility. Those funds should be used whenever possible instead of APC cost-share funds from the Charleston District.



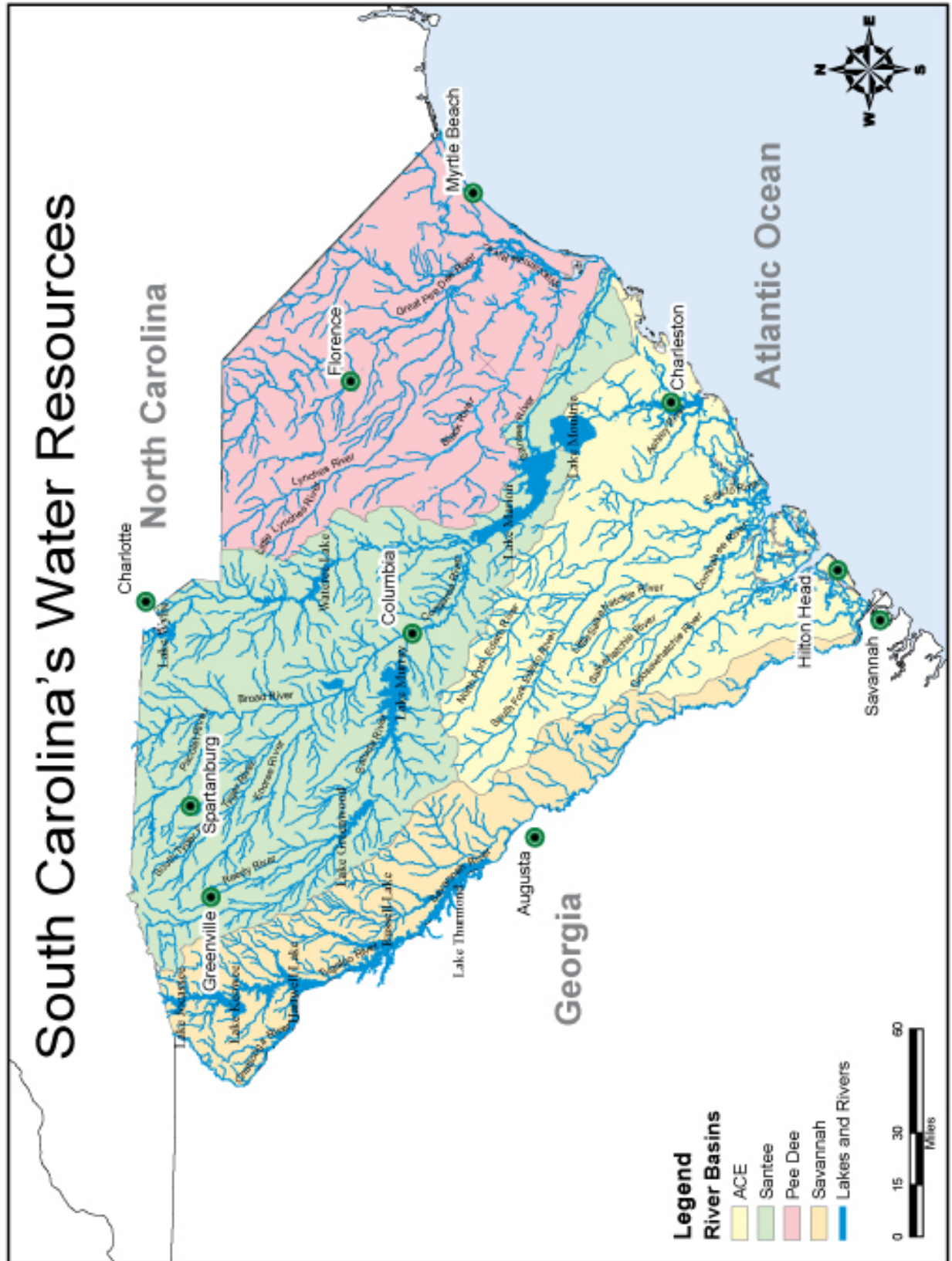
## Location of 2013 Management Sites



## Appendices

## **APPENDIX A**

### **Major River Basins in South Carolina**



## **APPENDIX B**

### **Additional Documentation for NPDES General Permit**

## NPDES Required Information Details

### 1) Aquatic Nuisance Species Program Emergency Numbers

SCDNR Main Street Office	803-734-4036	Radio Room – Law Enforcement	803-955-4000
SCDNR Emergency Number	800-922-5431	DHEC Local Number – Columbia	803-253-6488
Poison Control Hotline	800-222-1222	National Response Center	800-424-8802
Chemical Spill/Fish Kill Emergency Number (DHEC)		888-481-0125	
Clemson Department of Pesticide Regulation		864-646-2150	
Chris Page Program Manager Aquatic Nuisance Species Program SC Department of Natural Resources 2730 Fish Hatchery Road West Columbia, SC 29172 803-755-2836 Voice 803-600-7541 Cell		Michael Hook Field Supervisor Aquatic Nuisance Species Program SC Department of Natural Resources 2730 Fish Hatchery Road West Columbia, SC 29172 803-755-2872 Voice 803-667-1249 Cell	
Daniel Hood Technician Aquatic Nuisance Species Program SC Department of Natural Resources 2730 Fish Hatchery Road West Columbia, SC 29172 803-351-6718 Cell		Bob Cernuda Vice President-Southeast Division PLM Lake and Land Management Corp. 46 Veronica Road Georgetown, SC 29440 866 PRO-LAKE Toll Free-866 776-5253 843 545-1114 Voice 866 899-1627 Toll Free Fax 843 458-3022 Cell	

DNR Region	Counties	Land, Water & Conservation	Freshwater Fisheries Fish Kills	Wildlife Wildlife Problems	Law Enforcement	Marine Resources	Support Services
<b>Region I</b> (Clemson) 311 Natural Resources Drive Clemson, SC 29631 (864) 654-1671	Abbeville Anderson Cherokee Edgefield Greenville Greenwood Laurens McCormick Oconee Pickens Spartanburg Union	<u>Marc Cribb</u>  803-734-6367  803-331-1568 (Cell)	<u>Dan Rankin</u>  864-654-1671 Ext. 12  864-982-2175 (Cell)	<u>Tom Swaynham</u>  864-654-1671 Ext. 21  864-982-2921 (Cell)	CPT Jamie Landrum  864-654-8266 Ext 18  864-982-1707 (Cell)	None Assigned	<u>Don Winslow</u>  803-734-3672 (Main Columbia Office)  <u>Greg Lucas</u> 864-654-1671 Ext 22  864-380-5201 (Cell)
<b>Region II</b> (Florence) 2007 Pisgah Rd Florence, SC 29501 (843) 661-4766	Chester Chesterfield Darlington Dillon Fairfield Florence Lancaster Kershaw Lee Marion Marlboro Williamsburg York	<u>Marc Cribb</u>  803-734-6367  803-331-1568 (Cell)	<u>Robert Stroud</u>  843-661-4767  803-609-7018 (Cell)	<u>Sam Stokes</u>  843-870-3771 (Cell)	CPT Sandy Young  843-616-4290 (Cell)	None Assigned	<u>Scott Speares</u>  803-734-3624 (Main Columbia Office)
<b>Region III</b> (Columbia) PO Box 167 1000 Assembly St. Columbia, SC 29202 (803) 734-4303	Aiken Allendale Bamberg Barnwell Calhoun Clarendon Lexington Newberry Orangeburg Richland Saluda Sumter	<u>Marc Cribb</u>  803-734-6367  803-331-1568 (Cell)	<u>Hal Beard</u>  803-955-0462  803-609-7024 (Cell)	<u>Brett Moule</u>  803-734-3940  803-609-6988 (Cell)	CPT Harvin Brock  803-734-4303  803-260-6716 (Cell)	None Assigned	<u>DeAnne Gray</u>  803-734-3902 (Main Columbia Office)  <u>Richard Byrd</u> 803-734-3998 (Main Columbia Office)  803-360-0252 (cell)
<b>Region IV</b> (Charleston) PO Box 12559 217 Ft. Johnson Rd. Charleston, SC 29412 (843) 953-9307	Beaufort Berkeley Charleston Colleton Dorchester Georgetown Hampton Horry Jasper	<u>Marc Cribb</u>  803-734-6367  803-331-1568 (Cell)	<u>Scott Lamprecht</u>  843-953-5160  843-870-5810 (Cell)	<u>Sam Chappellear</u>  843-953-5291  843-870-5777 (Cell)	CPT Gentry Thames  843-953-9307  843-870-5641 (Cell)	<u>David Whitaker</u>  843-953-9392  843-442-2093 (Cell)	

2) Pest Management Area Description

(See AQUATIC PLANT MANAGEMENT STRATEGY section for Specific Water body.)

3) Control Measure Description

(See AQUATIC PLANT MANAGEMENT STRATEGY section for Specific Water body.)

4) Schedules and Procedures

(See AQUATIC PLANT MANAGEMENT STRATEGY section for Specific Water body.)

5) PESTICIDE SPILL POLICY AND PROCEDURES

- Put on protective clothing as may be appropriate: rubber boots, aprons, gloves, mask, and respirator. Use special caution if two different materials are spilled and mix together. They may react chemically to form noxious fumes.
- Immediately contain the spill. Use absorbents, dikes, mops or brooms, dirt or sand to retard the spread of the spill.

- c. Notify your Contacts listed above or person in charge.
- d. Recover the spill into containers (usually 5 gallon buckets or 30 gallon drums). Each warehouse should have at least one clean, empty 30-gallon drum for the purpose.
- e. After sealing each recovered material container, mark it or attach a tag clearly to identify its contents, approximate quantity and date.
- f. Move containers of spilled materials to a secure area.
- g. Prepare a spill report giving relevant information including date; location; material spilled; approximate quantity; actions taken; location of recovered material; cause or circumstances leading to spill; and recommendations on how to avoid this problem in the future.
- h. Contact the office for disposal instructions.

**DO NOT USE OR DISPOSE OF SPILLED MATERIALS WITHOUT PRIOR REVIEW.**

- i. Depending on the circumstances, the best disposal method will differ. Some potential alternatives are:
  - 1. Use in the normal course of business;
  - 2. Dilute and wash into sanitary sewer;
  - 3. Shipment to an approved hazardous waste facility; neutralization / detoxification on site.
  - 4. Since a decision on how best to dispose of a spill may be quite complex, we may want input from manufacturers, regulatory officials or technical advisors. Consult the office before acting.

**6) SPILL RESPONSE**

Purpose: To ensure the safety of all individuals participating in or affected by herbicide use, to minimize the SCDNR's and Contractor's exposure to liability, to ensure the appropriate and effective application of herbicides as a management tool, and to minimize detrimental effects to the environment.

<b><i>The following information will be provided following the discovery and initial telephonic reporting of the spill:</i></b>	
1.	Time spill occurred or was first observed:  _____
2.	Name of person first observing spill:  _____
3.	Location of initial spill and present location if moving:  _____
4.	Type of spilled material:  _____



5.	Estimate of amount spilled or rate of release if continuing:  _____
6.	Environmental conditions e.g., wind direction and speed, wave action, and currents:  _____
7.	If from mobile container (e.g., 2.5, 5, 15, 30, 55, tote):  _____
8.	Description of area likely to be affected by spill --e.g., riverbanks, lakes, land areas, wildlife areas:  _____
9.	Cause of spill, if determined:  _____
10.	Action taken to combat spill, if any:  _____
11.	Activities or authorities notified:  _____  _____  _____

### SPILL KIT CONTENTS

A spill kit is required to be assembled and placed in locations where pesticides are mixed, and on vehicles, which transport pesticides.

Shop Kit Quantity	Vehicle Kit Quantity	Item
1 (55 gal)	1 (5 gal)	open-head drum
1	1	pesticide spill policy and procedures

4	2	pairs of nitrile gloves
2	1	pairs of unvented goggles
2	1	respirator and pesticide cartridges
2	1	aprons (chemical resistant)
2	1	pairs of rubber boots
2	1	pairs of tyvek coveralls
1	1	dustpan
1	1	shop brush
12	6	heavy ply, polyethylene bags w/ties
1	1	first aid kit
80	10	lbs absorbent material
1	1	dozen blank labels
0	1	portable eyewash
1	0	synthetic fiber push broom
1	0	square-point "D" handle shovel

#### 7) SCDNR Required Practices

Required practices, described below, are designed to ensure that the SCDNR's standards for use of herbicides meet or exceed the U.S. EPA's Worker Protection Standard for Agricultural Pesticides.

- a. Prior to implementing use of any herbicide, the need for its use relative to management goals shall be described in the S.C. Aquatic Plant Management Plan, and/or in a Weed Plan specific to the site.
- b. Only employees or contractors, who are certified/licensed by state and/or local regulations, are authorized to apply herbicides.
- c. Application techniques, monitoring strategies, and impacts/progress toward goals and required reporting information shall be documented.
- d. Standard safety practices for storage, mixing, transportation, disposal of containers and unused herbicide, and spill management will be followed.
- e. Herbicide containers and related equipment will be stored in a secure containment area away from people, animals and food. Herbicide containers will be stored closed and inspected periodically. Hazardous waste will be labeled appropriately and include accumulation start dates.
- f. Additional training required for the proper use and maintenance of personal protective equipment (PPE) and other equipment or required by the Occupational Safety and Health Administration (OSHA) shall be coordinated.
- g. The point(s) of contact and threshold size for spills that must be reported shall be verified in advance with the appropriate local agency. This information and other

emergency related information shall be provided to all applicators and initial responders through a written contingency plan.

- h. Directions and contact numbers of the nearest emergency medical treatment facility will be provided to all applicators.
  - i. Investigations of herbicide related accidents and receipt of employee suggestions or complaints relating to safety and health issues involving herbicides will be used as a feedback mechanism that can be used to improve the program.
  - j. Decontamination kits must be readily available, and must include two one-gallon (or more) containers filled with potable water, eyewash kits or eyewash bottles with buffered isotonic eyewash, hand or body soap, paper or other disposable towels, a full Tyvek coverall with foot covers, and a map and directions to the nearest medical facility. Whenever possible, those who apply herbicides shall have access (within 15 minutes travel time or at the nearest vehicle access point, whichever is closest) to an eyewash kit and either a 1) shower or large sink, or 2) emergency decontamination and first aid kits.
  - k. Treated areas should be closed to public access until they are judged safe for re-entry (or until the herbicide dries or for the minimum period required by the product label, whichever is longer). Posting is not required in most places, but where it is required (usually by local statute), place notices at points of entry or the perimeter of treated areas. Posting notices should include a statement that the area has been or will be treated, name of the herbicide, date of treatment, appropriate precautions to be taken or the date when re-entry is judged to be safe, and a phone number for additional information. Notices should be removed after it is judged safe to re-enter the area.
  - l. Under the NPDES Permit requirements, the SCDNR is required to maintain records for all herbicide application activities. These records shall include information on site(s), purpose(s), name(s) and amount(s) of product(s) used, name(s) of applicator(s), and licensing requirements for all herbicide applications in the previous 12 months. In addition, a yearly report shall include the same information, with estimates for the upcoming 12 months.
- 8) Adverse Incident Response
- Any incident which results in adverse impacts to fish, wildlife, or non target plant species will be reported to the appropriate contacts as listed in the Section 1 contacts table. Additionally, the causes of the adverse impact will be determined through a scientific assessment to prevent or mitigate future problems.
- 9) Pesticide Monitoring Requirements
- a. While there are no specific pesticide residue monitoring requirements the SCDNR will maintain the following information along with any required monitoring data:
  - b. Records of equipment maintenance and calibration are to be maintained only by the entity performing the pest application activity (on behalf of self or client).
  - c. A copy of the NOI submitted to the Department and any correspondence exchanged between you and the Department specific to coverage under this permit;
  - d. The date on which you knew or reasonably should have known that you would exceed an annual treatment area threshold during any calendar year, as identified in Part 1.2.2;

- e. Surveillance method(s) used, date(s) of surveillance activities, and findings of surveillance;
- f. Target pest(s);
- g. Pest density prior to pesticide application;
- h. Company name and contact information for pesticide applicator;
- i. Pesticide application date(s);
- j. Description of treatment area, including location and size (acres or linear feet) of treatment area and identification of any waters, either by name or by location, to which you discharged any pesticide(s)(a GIS record of the specific area where discharge of herbicide occurs);
- k. Name of each pesticide product used including the EPA registration number;
- l. Quantity of pesticide applied (and specify if quantities are for the pesticide product as packaged or as formulated and applied);
- m. Concentration (%) of active ingredient in formulation;
- n. For pesticide applications directly to waters, the effective concentration of active ingredient required for control;
- o. Any unusual or unexpected effects identified to non-target organisms;
- p. Documentation of any equipment cleaning, calibration, and repair (to be kept by pesticide application equipment operator); and
- q. A copy of your PDMP, including any modifications made to the PDMP during the term of this permit.

#### 10) General Specifications

- a. The Contractor and SCDNR shall utilize equipment specifically designed for commercial application of herbicides. Equipment shall be kept in good operating condition at all times and must meet or exceed all safety requirements for this type of work. The equipment must be calibrated to disperse herbicides at the prescribed rate as outlined in the plan and records of said calibration shall be maintained. As a minimum requirement, the equipment shall meet the following conditions:
- b. The Contractor shall have a minimum of two watercraft (airboats) and a skiff with a “mudmotor” capable of traveling through heavily vegetated waterways. The watercraft shall be equipped with depth finders capable of locating vegetation underwater, such as an Eagle Ultra or equivalent make and model. The Contractor shall also have a computerized herbicide delivery spray system which is calibrated and has Global Positioning System capability on each watercraft capable of recording exact positions of all treatments. Such unit shall be capable of creating a file, such as a shape file, which will be capable of being imported into a Geographic Information System program such as ESRI’s ArcView or any ArcInfo based software and will provide SCDNR with a copy of such file in a timely manner. All data will become the property of SCDNR. The watercraft shall be capable of operation by one or two persons and shall be set up for underwater injection, handgun application, or granular broadcast application. A helicopter contract or access must also be available to the Contractor for performing aerial application of herbicides as needed at specified sites when needed.

- c. SCDNR reserves the right to inspect and approve all equipment to be utilized prior to the award. Non-conformance of equipment to SCDNR standards shall be reason for rejection of daily work.
- d. Regulations and Standards:
- e. The work shall comply with all laws, ordinances, and regulations of all legally constituted authorities that have jurisdiction over any part of this work. These requirements supplement these specifications and shall take precedence in case of conflict.
- f. All work shall be performed and completed in a thoroughly workman like manner in accordance with best modern practices and any permit requirements, regardless of any omissions from the attached specifications and/or drawings.

11) Qualifications

- a. The Contractor must have a minimum of five years of professional experience in the area of chemical aquatic weed control on large public waterbodies.
- b. All persons applying chemicals must be certified by the Clemson University Department of Pesticide Regulation in Category 5 (Aquatic Pest Control) or must work under the direct supervision of a person so tested and present on the spray boat.
- c. All persons applying chemicals must be capable of identifying target plants in the field.
- d. The Contractor must maintain liability insurance coverage of at least Five Million Dollars (\$5,000,000) to fulfill requirements of PART II.A.12.

## **APPENDIX C**

### **Enabling Legislation**

South Carolina Code of Laws Section 49-6-10/40

Title 49 – Waters, Water Resources and Drainage

## CHAPTER AQUATIC PLANT MANAGEMENT

SECTION 49-6- Purpose; administering agency.

There is hereby created the South Carolina Aquatic Plant Management Program for the purpose of preventing, identifying, investigating, managing, and monitoring aquatic plant problems in public waters of South Carolina. The program will coordinate the receipt and distribution of available federal, state, and local funds for aquatic plant management activities and research in public waters.

The Department of Natural Resources (department) is designated as the state agency to administer the Aquatic Plant Management Program and to apply for and receive grants and loans from the federal government or such other public and private sources as may be available for the Aquatic Plant Management Program and to coordinate the expenditure of such funds.

SECTION 49-6-20. Aquatic Plant Management Trust Fund.

There is created the South Carolina Aquatic Plant Management Trust Fund which must be kept separate from other funds of the State. The fund must be administered by the department for the purpose of receiving and expending funds for the prevention, management, and research of aquatic plant problems in public waters of South Carolina. Unexpended balances, including interest derived from the fund, must be carried forward each year and used for the purposes specified above. The fund shall be subject to annual audit by the Office of the State Auditor.

The fund is eligible to receive appropriations of state general funds, federal funds, local government funds, and funds from private entities including donations, grants, loans, gifts, bond issues, receipts, securities, and other monetary instruments of value. All reimbursements for monies expended from this fund must be deposited in this fund.

SECTION 49-6-30. Aquatic Plant Management Council; membership; duties.

There is hereby established the South Carolina Aquatic Plant Management Council, hereinafter referred to as the council, which shall be composed of ten members as follows:

The council shall include one representative from each of the following agencies, to be appointed by the chief executive officer of each agency:

- (a) Water Resources Division of the Department of Natural Resources;
- (b) South Carolina Department of Health and Environmental Control;
- (c) Wildlife and Freshwater Fish Division of the Department of Natural Resources;
- (d) South Carolina Department of Agriculture;
- (e) Coastal Division of the Department of Health and Environmental Control;
- (f) South Carolina Public Service Authority;
- (g) Land Resources and Conservation Districts Division of the Department of Natural Resources;

(h) South Carolina Department of Parks, Recreation and Tourism;

(i) Clemson University, Department of Fertilizer and Pesticide Control.

The council shall include one representative from the Governor's Office, to be appointed by the Governor.

The representative of the Water Resources Division of the Department of Natural Resources shall serve as chairman of the council and shall be a voting member of the council.

The council shall provide interagency coordination and serve as the principal advisory body to the department on all aspects of aquatic plant management and research. The council shall establish management policies, approve all management plans, and advise the department on research priorities.

#### SECTION 49-6-40. Aquatic Plant Management Plan.

The department, with advice and assistance from the council, shall develop an Aquatic Plant Management Plan for the State of South Carolina. The plan shall describe the procedures for problem site identification and analysis, selection of control methods, operational program development, and implementation of operational strategies. The plan shall also identify problem areas, prescribe management practices, and set management priorities. The plan shall be updated and amended at appropriate intervals as necessary; provided, however, problem site identification and allocation of funding shall be conducted annually. In addition, the department shall establish procedures for public input into the plan and its amendments and priorities. The public review procedures shall be an integral part of the plan development process. When deemed appropriate, the department may seek the advice and counsel of persons and organizations from the private, public, or academic sectors.

The council shall review and approve all plans and amendments. Approval shall consist of a two-thirds vote of the members present. The department shall have final approval authority over those sections which do not receive two-thirds approval of the council.

Some of the Specific State Laws which pertain to Illegal, Noxious, or Nuisance Species:

#### Title 46, Chapter 9 - State Crop Pest Act

The State Crop Pest Commission is authorized by law (Section 46-9-40) to promulgate and enforce reasonable regulations to eradicate or prevent the introduction, spread or dissemination of plant pests. Plant pests are by definition (Section 46-9-15(5)) any living state of insects, mites, nematodes, slugs, animals, protozoa, snails or other invertebrate animals, bacteria, weeds, fungi, other parasitic plants...which directly or indirectly may injure or cause disease or damage in plants...and which may be a serious agricultural threat to the State, as determined by the Director.

The State Crop Pest Commission is responsible for control of plant pests which constitute a threat to production agriculture. In so doing, the Commission is the primary contact point for cooperation with the Animal and Plant Health Inspection Service (APHIS), U. S. Department of Agriculture.

The Commission has designated certain organisms as plant pests. These organisms are already designated as noxious weeds by state and/or federal authorities or are under domestic federal



quarantine. Once a plant pest has been designated, the Commission has the authority to impose control measures, up to and including, quarantine of the premises. However, the Director, as the Commission's designee, retains the discretion to determine that a plant pest has become so widespread that further control measures are not warranted.

#### Title 46, Chapter 23 - South Carolina Noxious Weed Act

Provides far reaching powers to seize, quarantine, treat, destroy, apply other remedial measures, to export, return to shipping point, or otherwise dispose of in such a manner as (it) deems appropriate, any noxious weed or any product or article of any character whatsoever or any means of conveyance which (it) has reason to believe contains or is contaminated with any noxious weed, offered for movement, moving, or has moved into or through the state or intrastate. To further deter persons from spreading nuisance aquatic weeds the law includes fines not exceeding \$500 and/or imprisonment not exceeding one year.

SECTION 50-13-1415 -Importation, possession, or placing water hyacinth and hydrilla in waters of the state.

No person shall possess, sell, offer for sale, import, bring, or cause to be brought or imported into this State, or release or place into any waters of this State any of the following plants:

(1) Water Hyacinth

(2) Hydrilla

Provided, however, that the department may issue special import permits to qualified persons for research purposes only.

The department shall prescribe the methods, control, and restrictions which are to be adhered to by any person or his agent to whom a special permit under the provisions of this section is issued. The department is authorized to promulgate such regulations as may be necessary to effectuate the provisions of this section and the department, by regulation, is specifically authorized to prohibit additional species of plants from being imported, possessed, or sold in this State when, in the discretion of the department, such species of plants are potentially dangerous.

SECTION 50-13-1630. Importing, possessing or selling certain fish unlawful; special permits for research; Department shall issue rules and regulations.

(A) A person may not possess, sell, offer for sale, import, bring, or cause to be brought or imported into this State or release into the waters of this State the following fish or eggs of the fish:

(1) carnero or candiru catfish (*Vandellia cirrhosa*);

(2) freshwater electric eel (*Electrophorus electricus*);

(3) white amur or grass carp (*Ctenopharyngodon idella*);

(4) walking catfish or a member of the Clariidae family (*Clarias*, *Heteropneustea*, *Gymnallabes*, *Channallabes*, or *Heterobranchus* genera); (5) piranha (all members of *Serrasalmus*, *Rooseveltiella*, and *Pygocentrus* genera);

(6) stickleback;

(7) Mexican banded tetra;

(8) sea lamprey;

- (9) rudd (*Scardinius erythrophthalmus*-Linnaeus); and
- (10) snakehead (all members of family Channidae).

(B) The department may issue special import permits to qualified persons for research and education only.

(C) (1) The department may issue special permits for the stocking of sterile white amur or grass carp hybrids in the waters of this State. The special permits must certify that the permittee's white amur or grass carp hybrids have been tested and determined to be sterile. The department may charge a fee of one dollar for each white amur or grass carp hybrid that measures five inches or longer or twenty-five cents for each white amur or grass carp hybrid that measures less than five inches. The fee collected for sterility testing must be retained by the department and used to offset the costs of the testing.

(2) The department is authorized to promulgate regulations to establish a fee schedule to replace the fee schedule contained in item (1) of this subsection. Upon these regulations taking effect, the fee schedule contained in item (1) of this subsection no longer applies.

(D) The department may issue special permits for the importation, breeding, and possession of nonsterile white amur or grass carp hybrids. The permits must be issued pursuant to the requirements contained in Chapter 18 of this title. Provided, however, that no white amur or grass carp hybrids imported, bred, or possessed pursuant to a special permit issued pursuant to this section may be stocked in the waters of this State except as provided in subsection (C) of this section.

(E) It is unlawful to take grass carp from waters stocked as permitted by this section. Grass carp caught must be returned to the water from which it was taken immediately.

(F) The department must prescribe the qualifications, methods, controls, and restrictions required of a person or his agent to whom a special permit is issued. The department must condition all permits issued under this section to safeguard public safety and welfare and prevent the introduction into the wild or release of nonnative species of fish or other organisms into the waters of this State. The department may promulgate regulations necessary to effectuate this section and specifically to prohibit additional species of fish from being imported, possessed, or sold in this State when the department determines the species of fish are potentially dangerous.

## **APPENDIX D**

### **Aquatic Plant Problem Identification Form**

## Aquatic Plant Problem Site Identification Form

Name and location of affected water body

GPS Location (LAT/LONG or UTM. specify projection)

Public or private water

Name of problem plant (if known)

Does the plant grow above or below the surface of the water?

Approximate area of water covered by the problem plant

Type of water use(s) affected by the plant

Length of time problem has existed

Plant control methods that have been used

Contact for additional information: \_\_\_\_\_

Name \_\_\_\_\_

Address \_\_\_\_\_

Phone \_\_\_\_\_

Please Return To: Aquatic Nuisance Species Program

S.C. Department of Natural Resources

2730 Fish Hatchery Road

West Columbia, South Carolina 29170

(803) 755-2836 email: [invasiveweeds@dnr.sc.gov](mailto:invasiveweeds@dnr.sc.gov)

*\*\* Please include a sample of the plant, if possible, or a detailed digital image. Wrap the plant in a moist towel and place in a "baggie". The sample or photo should include flowers, if visible, along with leaf structure and stem. A photo or drawing of the affected area with an approximate acreage should also accompany this form.*

## **APPENDIX E**

### **Aquatic Plant Control Agents**

## Aquatic Plant Control Agents

Listed below are the major aquatic plant control agents which are currently available for use in South Carolina. While the list is not all inclusive, it does contain those agents considered most useful for aquatic plant management. Costs for the agents are approximations and will vary somewhat depending on the source and amount purchased. Application costs are approximations of commercial applicator rates.

### **I. Chemical Control**

#### **A. Diquat (Reward, Tribune, Solera)**

##### Target Plants

Submersed species - Bladderwort, coontail, elodea, naiad, pondweeds, watermilfoil, and hydrilla.  
Floating species - Pennywort, Salvinia, water hyacinth, water lettuce, and duckweed.

##### Application Rate

Submersed species - One to two gallons per surface acre. Floating species - One half to one gallon per surface acre, depending on target species.

Cost -Diquat costs approximately \$99 per gallon. Assuming an application rate of two gallons per acre and an application cost of \$41 per acre, the total cost would be \$239 per acre per application for submersed species. The treatment cost for floating species at one-half gallon per acre rate would be \$90 per acre.

Use Considerations -Diquat is not toxic to fish or wildlife at normal use concentrations. It is non-volatile and nonflammable, but can cause irritation to eyes and skin upon contact. Its effectiveness is greatly reduced at temperatures below 50-60°F, by overcast conditions, and by turbid waters.

Water Use Restrictions - Water treated with Diquat cannot be used for drinking for up to 3 days, livestock consumption for one day, irrigation of food crops for 5 days, and irrigation of turf and ornamentals for up to 3 days depending on application rate or until approved analysis indicates that diquat ion concentrations are less than 0.02 ppm. There are no fishing or swimming restrictions. Do not apply this product within 1600 feet upstream of an operating water intake in flowing water bodies (rivers, streams, canals) or within 400 feet of an operating water intake in standing water bodies (lakes, reservoirs). To make applications within these restricted areas, the intake must be turned off for the time periods specified on the Federal label for the appropriate use category (Drinking, Livestock consumption, Irrigation) or until the treated area contains less than 0.02 ppm of diquat dibromide.

#### **B. 2,4-D (Aqua-Kleen, Navigate, Hardball, Sinkerball, Renovate Max G)**

##### Target Plants

Emergent species - Broadleaf species such as water primrose, waterlily, spatterdock, watershield, smartweed, pondweeds, and floating heart. Submersed species - Watermilfoil, bladderwort, and coontail. Floating species - Water hyacinth.

##### Application Rate

Granular form (2,4-D BEE) - 150 to 200 pounds per acre depending on target species. Liquid form - (2,4-D DMA) - 5 gallons per acre.

#### Cost

The granular form of 2,4-D costs about \$36 per pound. Assuming an application rate of 200 pounds per acre and an application cost of \$47 per acre, the total cost would be \$519 per application. The liquid form of 2,4-D costs approximately \$31 per gallon. Assuming an application rate of 5 gallons per acre and an application cost of \$41 per acre, the total cost would be \$196 per application.

Use Considerations - The recommended formulations of 2,4-D are not toxic to fish or wildlife at normal use concentrations. This chemical is nonflammable and noncorrosive.

Water use Restrictions - Do not apply to waters used for irrigation, agricultural sprays, watering dairy animals, or domestic water supplies.

### **C. Chelated Copper (Cutrine Plus, Clearigate, Komeen, K-TEA, Nautique, Captain, Natrix)**

#### Target Plants

Algae - Cutrine Plus, K-TEA, Captain

Submersed species (Hydrilla, Brazilian elodea, pondweed and southern naiad) - Komeen, Nautique, Cutrine Plus, Clearigate, and Captain

#### Application Rate

Algae - Treatment concentration of 0.2-0.5 parts per million of copper. Submersed species - 0 part per million of copper (12-16 gallons per acre) or mix two gallons of copper complex and two gallons of Diquat per acre.

Cost - Copper products cost about \$17 per gallon. Assuming an application rate of 16 gallons per acre and an application cost of \$41 per acre, the total cost would be \$313 per acre.

Use Considerations - Copper may be toxic to fish and aquatic invertebrates at recommended application rates, especially in soft water. Copper-based product should be carefully applied and monitored to minimize the risk of fish kills.

Water Use Restrictions - Copper complexes may be used in domestic and irrigation water supplies without water use restrictions.

### **D. Endothal - (Aquathol, Aquathol K, Aquathol Super K granular, Hydrothol 191 granular and liquid)**

#### Target Plants

Aquathol products are effective for submersed species such as naiads, bladderwort, coontail, watermilfoil, pondweed, hydrilla, and cabomba.

Hydrothol 191 is effective on the species listed above as well as filamentous and macrophytic algae.

#### Application Rate

##### Aquathol

Liquid form (Aquathol K) - three gallons or more per acre depending on the target species. Granular form - Aquathol: 54-323 pounds per acre depending on water depth and the target species.

Aquathol Super K: 22-66 pounds per acre depending on the water depth and the target species.

### Hydrothol 191

Heavy Infestations - Evenly spread 160 - 270 pounds per acre foot of water (0 - 0 ppm) applied evenly. Moderate or light infestations - Use 55 - 110 pounds per acre foot (0 - 0 ppm) applied evenly.

Cost

### Aquathol

Aquathol K costs approximately \$57 per gallon. Assuming an application rate of 5 gallons per acre and an application cost of \$41 per acre, the total cost would be \$326 per acre. Aquathol Super K costs about \$15 per pound at an application rate of 30 pounds per acre and an application cost of \$47 per acre, the total cost would be \$510 per acre.

### Hydrothol 191

Hydrothol 191 costs approximately \$64 per gallon. Assuming an application rate of 7 gallons per acre and an application cost of \$41, the total cost would be \$492 per acre.

Hydrothol 191 granular costs approximately \$78 per pound. Assuming an application rate of 240 pounds per acre and an application cost of \$47, the total cost would be \$714 per acre.

Use Considerations - Concentrated endothall formulations are toxic to man if ingested or absorbed through the skin. They are also irritating to the skin and eyes. Avoid contact with or drift to other crops or plants as injury may result. Generally not toxic to fish at normal use concentrations, however, fish may be killed by dosages of Hydrothol 191 in excess of 0.3 ppm.

Water Use Restrictions - Water treated with endothall cannot be used for watering livestock, preparing agricultural sprays for food crops, for irrigation or domestic purposes for 7 to 25 days after treatment (depending on treatment concentration) or until such time that the water does not contain more than 0.2 ppm of endothall. Do not use fish from treated areas for feed or food for three days after treatment.

### **E. Glyphosate (Rodeo, Aquastar, Touchdown Pro, Glypro)**

Target Plants - Emergent broadleaf plants and grasses such as alligatorweed, water primrose, smartweed, and Phragmites.

Application Rate - Up to 7 1/2 pints per acre, the specific rate depending on the target species.

Cost - Glyphosate products range in price from \$21-\$39 per gallon. At an application rate of 5 pints per acre and an application cost of \$41 per acre, the total would range from \$63-\$78 per acre per application.

Use Considerations - Glyphosate is not toxic to mammals, birds or fish at recommended use concentrations. Glyphosate products with aquatic labels can be used in and around aquatic sites, including all bodies of fresh and brackish water which may be flowing or nonflowing.

Water Use Restrictions - Do not apply within 0.5 miles upstream of potable water intakes unless water intake is shut off for 48 hours. There are no restrictions on water use for irrigation or recreation after treatment.

### **F. Flumioxazin (Clipper)**

Target Plants – Duckweed, water meal, water lettuce, frog's-bit, water fern, alligatorweed



Application Rate - Up to 12 ounces of formulated product per acre, on surface applications or 200 - 400 ppb for subsurface treatment.

Cost - Flumioxazin products range in price from \$120-140 per pound. At an application rate of 12 ounces per acre and an application cost of \$41 per acre, the total would range from \$131-\$146 per acre per application.

Use Considerations - Flumioxazin is not toxic to mammals, birds or fish at recommended use concentrations. Flumioxazin products with aquatic labels can be used in and around aquatic sites, including all bodies of fresh and brackish water which may be flowing or nonflowing.

Water Use Restrictions There are no restrictions on potable water use or recreation after treatment. Treated water may not be used for irrigation purposes on food crops until at least five (5) days after application. Do not use in water utilized for crawfish farming. Do not re-treat the same section of water with *Clipper* Herbicide more than 6 times per year. Do not exceed 400 ppb of *Clipper* Herbicide during any one application. On surface spray applications of less than 3 feet of depth there is a 12 hour restriction for irrigation of turf and landscape ornamentals and a restriction of subsurface treatment applications of 1 to 3 days depending on the concentration used. There is also a 5 day restriction for ornamentals grown for production in greenhouses and nurseries for both surface and subsurface application.

#### **G. Fluridone (Sonar, Avast)**

Target Plants - Primarily submersed plants, such as hydrilla, Brazilian elodea, watermilfoil, pondweeds, duckweeds and naiads; also effective on lilies and some grasses.

Application Rate Liquid form (Sonar AS, Avast) - 1-4 pints per acre depending on water depth. Pellet forms (Sonar PR, Sonar SRP, Avast SRG) - 15 to 80 pounds per acre depending on water depth.

Cost - The liquid formulation ranges from \$1468-\$1650 per gallon. Assuming an application rate of 5 pints per acre (2 pounds active ingredient per acre) and an application cost of \$40 per acre, the total cost would be \$349 per acre per application. The pellet formulations range in price from \$200-\$200 per pound. Assuming an application rate of 20 pounds per acre (2 pounds active ingredient per acre) and an application cost of \$47 per acre, the total cost would be \$567 per acre per application.

Use Considerations - In large lakes and reservoirs fluridone should be applied to areas greater than five acres. This herbicide requires a long contact time and is not effective in sites with significant water movement or rapid dilution. Fluridone is slow acting and may require 30 to 90 days to achieve desired control under optimal conditions. Unlike other aquatic herbicides, fluridone has proven effective in inhibiting viable hydrilla tuber production.

Water Use Restrictions - Do not apply within 1/4 mile of a functioning potable water intake unless concentrations are less than 20 ppm. Water treated with fluridone cannot be used for irrigation for 7-30 days depending on target crop.

#### **H. Imazapyr (Habitat)**

Target Plants - Phragmites, Alligatorweed, Water primrose, and Cutgrass.

Application Rate - 1 to 6 pints per acre depending on target species.

Cost - Habitat (Imazapyr) costs \$245 per gallon. Assuming the application rate of 16 oz. per acre and an application cost of \$41 per acre, the total cost would be \$78 per acre.

Use Considerations - Applications to public waters can only be made by federal, state, or local agencies or those applicators which are licensed or certified as aquatic pest control applicators and are authorized by state or local agencies. Do not use in close proximity to hardwoods.

Water Use Restrictions - Do not apply within ½ mile of potable water intakes. For applications within ½ mile of a potable water intake, the intake must be turned off for a minimum of 48 hours. Do not apply within 1 mile of active irrigation intakes on still or slow moving waters. Irrigation water usage may be continued 120 days after application or when Habitat (Imazapyr) residue levels are determined by laboratory analysis to be 0 ppb or less.

Aerial Applications may only be made by helicopter.

#### **I. Imazamox (Clearcast)**

Target Plants - Phragmites, Alligatorweed, Water primrose, and Cutgrass.

Application Rate - 1 to 6 pints per acre depending on target species.

Cost -Clearcast (Imazamox) costs \$175 per gallon. Assuming the application rate of 16 oz. per acre and an application cost of \$41 per acre, the total cost would be \$63 per acre.

Use Considerations - Applications to public waters can only be made by federal, state, or local agencies or those applicators which are licensed or certified as aquatic pest control applicators and are authorized by state or local agencies. Can be used in close proximity to hardwoods

Water Use Restrictions - Do not apply within ½ mile of potable water intakes. For applications within ½ mile of a potable water intake, the intake must be turned off for a minimum of 48 hours. Do not apply within 1 mile of active irrigation intakes on still or slow moving waters. Irrigation water usage may be continued 120 days after application or when Habitat (Imazapyr) residue levels are determined by laboratory analysis to be 0 ppb or less.

Aerial Applications may only be made by helicopter.

#### **J. Triclopyr (Renovate 3, Tahoe)**

Target Plants - Alligatorweed, Eurasian watermilfoil, water hyacinth, parrotfeather, and water primrose.

Application Rate - 2-8 qts. per acre depending on target species.

Cost - Triclopyr products cost \$96 per gallon. Assuming the application rate of 2 qts per acre and an application cost of \$41 per acre, the total cost would be \$89 per acre.

Use Considerations - Triclopyr is not toxic to fish or wildlife at normal use concentrations. It can cause severe irritation to eyes and skin upon contact. It is suggested that it is used in a manner to reduce the possibility of drift. The proper personal protective equipment should be used as prescribed by the Federal label.

Water Use Restrictions - For floating and emergent applications do not apply within 200 feet of operating potable water intakes when using 4 - 8 qts. per acre. There are no setback restrictions for potable water intakes when 2 qts. per acre or less is applied to emergent vegetation. To make applications within these restricted areas, follow the label directions. There are no restrictions on the use of treated water for recreational purposes or for livestock consumption.

#### **K. Penoxsulam (Galleon SC)**

Target Plants

Submersed species – Hydrilla, Cabomba, Egeria, Eurasian watermilfoil

Floating species – Floating species – Water hyacinth, Water lettuce, Water fern, Duckweed, Frog's bit, Mosquito fern

Application Rates

0.174 fl oz per acre foot to achieve minimum effective concentration of 25 – 75 ppb.

Floating species – 2- 6 fl oz per acre as foliar application.

Cost – Penoxsulam costs approximately \$1650 per gallon. Assuming an application rate of 11 fl oz per acre and an application cost of \$41 per acre, total cost would be \$183 per acre for submersed plants. Assuming an application rate of 6 fl oz per acre, and an application cost of \$41 per acre, total cost would be \$113 per acre for emergent plants.

Use considerations – Penoxsulam has no potable water restrictions or irrigation restrictions except for irrigation of food crops. It must have prolonged contact times similar to fluridone (>21 days).

Water Use Restrictions - Food crop irrigation waters cannot be used if penoxsulam concentrations are above 1ppb

## **II. Biological Control**

Alligatorweed Flea Beetle (*Agasicles hygrophila*)

Target Plant - Alligatorweed

Stocking Rate - 600-1,000 per acre.

Cost - The U.S. Army Corps of Engineers office in Palatka, Florida will provide lots of 6,000 flea beetles for the cost of shipping which is about \$50 per shipment. Flea beetles may also be obtained from the U.S. Department of Agriculture.

Use Considerations - Flea beetles feed only on alligatorweed and pose no threat to desirable plant species. They produce no adverse impact on the aquatic environment. As with all biological control agents, flea beetles may not remain in the area where stocked but may migrate to other areas of alligatorweed infestation. These insects are not able to survive severe winters and may require occasional restocking. The effectiveness of these insects may be enhanced by use with an aquatic herbicide such as 2, 4-D, or Rodeo.

Alligatorweed Stem Borer Moth (*Vogtia malloi*)

Target Plant - Alligatorweed

Cost - Approximately the same as for flea beetle.

Use Considerations - Same as for flea beetle.

Alligatorweed Thrip (*Amynothrips andersonii*) - This insect feeds on alligatorweed and has been stocked in South Carolina. It has failed to become established in the State and is considered less desirable than flea beetles or stem borers for control of alligatorweed.

D. Triploid White Amur or grass carp (*Ctenopharygodon idella*)

Target Plant - Primarily submersed plants including Brazilian elodea, hydrilla, bladderwort, coontail, naiads, pondweeds.

Cost - Triploid white amur cost \$4 to \$7 each. At a stocking rate of 15 to 25 fish per vegetated acre, the total cost could range from \$60 to \$175 per acre.

Use Considerations - Only the triploid (sterile) white amur may be stocked in South Carolina for aquatic weed control. Introduction and stocking of this fish is regulated by the S.C. Department of Natural Resources and requires a permit. Escapement over some dams may occur during high flow periods. Use of barriers in some lakes should prevent fish loss. While grass carp are effective on a wide variety of submersed plants, they generally do not provide effective control of watermilfoil species. Plants should be carefully identified prior to stocking to ensure proper stocking rates and potential efficacy.

E. Tilapia (*Tilapia* sp.) - Several species of this herbivorous fish have been used to control filamentous algae and submersed macrophytes. Tilapia cannot overwinter in South Carolina. Introduction of fish is regulated by the S.C. Department of Natural Resources.

### **III. Mechanical Control**

Harvesters, Cutters, Dredges and Draglines

Target Plants - All species

Cost - Harvesters range in cost from \$5,000 to over \$150,000 for the initial investment. Operating cost range from \$300 to \$700 per acre.

Use Consideration - Harvesters can be used in irrigation and drinking water supplies without water use restrictions. They may actually spread some plants such as Brazilian elodea and hydrilla by dispersing plant fragments which form new colonies. Harvesting requires the availability of a land disposal site for harvested plants. These devices cannot be used on water bodies which have debris and obstructions which interfere with operation. Harvesters are slow, with a maximum coverage of about five acres per day.

Fiberglass Bottom Screens

Target Plants - All species which root in the bottom.

Cost \$10,000 per acre.

Use Considerations - Bottom screens may be detrimental to bottom-dwelling aquatic organisms. Due to high cost, use is usually restricted to beaches and other swimming areas where a relatively small area of control is required.

### **IV. Environmental Alterations**

Water Level Manipulation - Some species of aquatic plants can be controlled by a periodic raising or lowering of water level. Shoreline grasses, cattails, and Phragmites can be controlled, to some extent, by maintaining higher than normal water levels during the plant growing season. Periodic lowering of water and drying of the bottom can reduce abundance of a number of submersed and emersed species. Disadvantages are that water level fluctuation can adversely affect water uses such as recreation, hydroelectric power production, wildlife protection, and others. Also, some plant species may actually be favored by water level variations. Many factors must be considered before using this method for aquatic plant control.

Reduction in Sedimentation and Nutrient Loading - Sedimentation decreases depth of the water body and increased the area where aquatic plants can grow. Nutrient enrichment resulting from man's activities usually does not create aquatic plant problems, but does contribute to existing problems. Reduction in these two environmental factors can assist in aquatic plant management,

but is not a sufficient control method by itself. The mechanism for control of these factors is through implementation of Best Management Practices for Control of Non-Point Source Pollution developed by the S.C. Department of Health and Environmental Control, and through the wastewater discharge permitting program (NPDES) also administered by the S.C. Department of Health and Environmental Control.

## **APPENDIX F**

### **SCDNR and Santee Cooper**

### **Aquatic Plant and Habitat Management Goals for the Santee Cooper Lakes**

S.C. Department of Natural Resources and Santee Cooper Aquatic Plant and Habitat  
Management Goals for the Santee Cooper Lakes

MEMORANDUM OF AGREEMENT  
BETWEEN SANTEE COOPER AND  
SOUTH CAROLINA DEPARTMENT OF NATURAL RESOURCES  
REGARDING AQUATIC PLANT AND HABITAT MANAGEMENT GOALS  
FOR THE SANTEE COOPER LAKES

This AGREEMENT (hereinafter "Agreement") is between Santee Cooper (hereinafter "S-C") and the South Carolina Department of Natural Resources (hereinafter "DNR"). This Agreement is effective on the date of the last signatory to the Agreement.

WHEREAS, S-C and DNR recognize Lakes Marion and Moultrie (hereinafter "Lakes") as a significant natural resource of the State of South Carolina, and

WHEREAS, in order to provide balanced benefits to natural resources and the multiple uses of the Lakes, DNR and S-C (hereinafter "Parties") agree to cooperate in the management of aquatic vegetation and the habitat that it provides, and

WHEREAS, the Parties' goal is to maintain, at a minimum, 10% of the surface area of the Lakes as beneficial vegetated habitat for waterfowl, wildlife, fish and other aquatic organisms,

THEREFORE, in order to achieve this goal, the Parties agree to the following:

- 1) The aquatic plant management goal for the Lakes is to achieve a diverse assemblage of native aquatic vegetation in and on, at a minimum, 10% of the total surface area of the Lakes and to effectively control non-native invasive species. The aquatic plant coverage should include a combination of submerse, floating leaf, and emergent plant species that provide habitat and food to game and non-game fish and wildlife species. The goal would be for this vegetation to be distributed throughout the Lakes.
- 2) S-C will annually monitor the vegetative community and extent of coverage. This monitoring may include aerial photography, visual surveys, hydro-acoustic transects and other appropriate measures as deemed necessary by the Parties in the annual work plan, in order to map plant species and coverage. An annual report of the monitoring results will be completed at the end of each growing season and provided to the Parties prior to preparation of the work plan for the following year.
- 3) The Parties will cooperate in monitoring the health of the fishery and in monitoring of wintering waterfowl populations. Wintering waterfowl population monitoring may consist of aerial or other census techniques as deemed appropriate by the Parties. When waterfowl census is utilized, DNR will provide personnel and prepare an annual report to be distributed to both agencies, and S-C will provide the flight time.
- 4) Sterile grass carp will continue to be a major component of the long-term management strategy in controlling hydrilla (*Hydrilla verticillata*). The Parties will meet at least annually to review the monitoring data and to develop recommendations for maintenance stocking levels and other control strategies. These recommendations will be jointly presented to the South Carolina

Aquatic Plant management Council (hereinafter "Council"). The implementation of these recommendations will be subject to approval by the Council.

- 5) Aquatic vegetation will not be controlled in Santee Cooper Project water bodies that are totally isolated from the Lakes unless it conflicts with specific water uses or is identified as a state or federal noxious weed and poses a threat to the Lakes.
- 6) Localized aquatic vegetation control using approved chemical or mechanical methods may be necessary in areas where vegetation interferes with hydroelectric power production or other legitimate uses of the Lakes regardless of plant coverage and distribution.
- 7) In order to enhance native plant growth and habitat throughout the lake system, the Parties will cooperate in implementing innovative management techniques. These techniques could include such measures as, introducing desirable native plant species, enhancing wildlife/waterfowl management areas, and implementing strategic lake level management measures.
- 8) The Parties will meet annually to review the results of monitoring and treatment programs to determine the effectiveness of the programs, and to develop annual work plans.
- 9) Every five years the Parties will meet to conduct a comprehensive review of the programs and to determine the success in meeting the overall management goals. Based upon this review, the provisions of this agreement may be modified, as deemed appropriate, by the mutual consent of the Parties.

IN WITNESS WHEREOF, the Parties hereto have executed this Agreement as of the date hereof.

SANTEE COOPER

By: R.M. Singleton, III

Date: 2/3/2010

SOUTH CAROLINA DEPARTMENT OF  
NATURAL RESOURCES

By: John G. Frank

Date: 2-22-10



**APPENDIX G**

**Summary of Aquatic Plant Control Expenditures - NOTE: The table for 2012 needs revision based on incomplete data compilation which is not yet available**

## **SUMMARY OF AQUATIC PLANT CONTROL EXPENDITURES – (1981 THROUGH CURRENT)**

During 1981, the Council received \$60,000 in Federal matching funds through the U.S. Army Corps of Engineers. The Council allocated \$57,000 of these funds to the S.C. Public Service Authority for plant management at Lake Marion. The Authority used these funds to chemically treat approximately 500 acres of the area uplake of the Rimini railroad trestle. The herbicide diquat was used to treat for Brazilian elodea and other submersed weed species. The remainder of the Federal funds were used to assist in development of the Council's management program.

During 1982, \$30,000 in Federal funds were allocated to the S.C. Public Service Authority for control of hydrilla and other nuisance plants at Lake Marion. An additional \$13,500 was allocated to Berkeley County for control of water hyacinths at Goose Creek Reservoir.

During 1983, \$155,000 in Federal matching funds were allocated to the S.C. Public Service Authority for plant control at Lake Marion. These funds were used to treat approximately 1,400 acres of upper Lake Marion with diquat, endothall and fluridone for control of Brazilian elodea, hydrilla and other submersed plants. The Council also provided \$4,500 in Federal matching funds to Berkeley County for maintenance control of water hyacinths at Goose Creek Reservoir.

During 1984, \$249,500 in Federal funds and \$40,500 in State funds were allocated to the S.C. Public Service Authority for aquatic weed control at Lake Marion. The S.C. Electric and Gas Company was allocated \$25,000 for control of hydrilla and other submersed aquatic weeds at Back River Reservoir. Berkeley County was allocated \$5,000 for maintenance control of water hyacinth at Goose Creek Reservoir.

Calendar year 1985 represented the first year of significant funding for aquatic plant management in South Carolina since the establishment of the Aquatic Plant Management Program in 1980. Funding was available from State and Federal sources over separate fiscal years. A total expenditure of \$701,349 was used to control nuisance aquatic plant populations on 29 water bodies around the State. Of this expenditure, \$98,377 was used for biological control by triploid grass carp and \$602,972 was used for chemical control operations.

During 1986, a mild winter coupled with low lake levels and clear water due to a severe drought resulted in an abundance of submersed aquatic plants. Hydrilla populations in Lake Marion and Back River Reservoir increased in coverage and new populations were discovered in the Cooper River ricefields. A total of 38 water bodies (4,925 acres) were managed for aquatic weeds at a cost of \$704,090. Herbicide applications were made on 33 lakes (4,441 acres) at a cost of \$673,979. Biological controls were implemented on nine water bodies around the State at a cost of \$30,111.

During 1987, a total of \$604,695 in State and Federal funds were expended for aquatic weed control in public waters. Chemical control work amounting to \$599,445 was conducted in 26 public water bodies. Biological control, including stocking triploid grass carp and alligatorweed flea beetles, was conducted at eight water bodies for a total expenditure of \$5,250.

During 1988, a total of \$631,164 in State, Federal, and local funds were expended for aquatic plant control activities in 25 water bodies. Because of reductions in the amount of Federal match from 70

percent to 50 percent of total control cost, local sponsors were for the first time required to provide at least 15 percent of control costs. Approved aquatic herbicides were applied to 3,258 acres on 21 water bodies at a total cost of \$583,764. Biological controls were implemented on four water bodies at a cost of \$47,400.

During 1989, a total of \$827,630 in Federal, State, and local funds were expended for aquatic plant control operations in 23 water bodies. Aquatic herbicides were applied to 2620 acres on 21 water bodies at a cost of \$422,009. A three year triploid grass carp stocking project was initiated on Lake Marion with the release of 100,000 sterile grass carp. Because this represents the largest such stocking in the country to date, biological control expenditures were substantially higher than in previous years, totaling \$405,621.

During 1990, a total of \$944,194 were expended for aquatic plant control activities on 24 water bodies. Herbicide treatments were made to all water bodies (2850 acres) at a cost of \$524,194. Lake Marion received its second installment of 100,000 triploid grass carp at a cost of \$420,000. Because of limited federal funds and a substantial increase in local funds (primarily from Santee Cooper), this was the first year that there were insufficient federal funds available to match all planned control operations. The Corps of Engineers provided 47 percent of total funding, while state and local entities provided 16 percent and 37 percent, respectively.

In 1991, aquatic plant management operations were conducted on 18 public water bodies at a total cost of \$1,965,387. The exceptionally large expenditure was a result of emergency control operations to alleviate blockage of the St. Stephen Hydroelectric facility on Lake Moultrie by hydrilla. A record high 6838 acres was treated with aquatic herbicides at a cost of \$1,505,771. Biological control agents were used on five lakes at a cost of \$459,615. Most of this included the third stocking of triploid grass carp in upper Lake Marion. While 50 percent of program funding was provided by the U.S. Army Corps of Engineers, 9 percent was provided by the State and 41 percent by local entities.

In 1992, 22 water bodies received control operations at a total cost of \$1,859,709. While last year's expenditures were higher, over 1,000 acres were treated by Santee Cooper at a cost of over \$200,000 but were not cost shared through the State program. Fifty percent of funding was provided by the U.S. Army Corps of Engineers, 8 percent by the State, and 42 percent by local entities. About 6,888 acres were treated with aquatic herbicide at a cost of \$1,447,864. Biological control agents (sterile grass carp and Tilapia) were introduced to six water bodies at a cost of \$411,845. This was the first year in which widespread hydrilla control was evident in upper Lake Marion from the grass carp. Hydrilla was controlled in over 6,500 acres in Stumphole, Low Falls, Elliotts Flats, and tree line areas. Compared to 1990 coverage, this represents an 80 percent reduction.

During 1993, a total of \$2,050,736 were expended for aquatic plant control activities on 27 water bodies. Forty-six percent of the funding was provided by the U.S. Army Corps of Engineers, 5 percent by the Department of Natural Resources, and 49 percent by various local sponsors. Aquatic herbicide treatments were made on 23 water bodies (8,125 acres) at a total cost of \$1,828,335. Biological control agents (grass carp and tilapia) were used on 11 lakes at a cost of \$222,400. Grass

carp stocked in upper Lake Marion in 1989-92 provided control (over 9,000 acres) for the second consecutive year. As a result of this success, stocking efforts were initiated in Lake Moultrie with the release of 50,000 grass carp. Hydrilla was discovered in Lake Murray this year resulting in unplanned treatment operations at several boat ramps and swimming beaches.

During 1994, aquatic plant management operations were conducted on 28 water bodies at a total cost of \$2,876,763. The U.S. Army Corps of Engineers provided 50 percent of all funds, while the State provided 7 percent and local entities provided 43 percent. Aquatic herbicide treatments were conducted on all water bodies (9,090 acres) at a cost of \$2,370,025. Grass carp were stocked in five lakes to control 10,242 acres at a cost of \$506,738. Lake Moultrie received the most grass carp (150,000 fish) to help increase the number of fish to target levels. Grass carp continue to control over 9,000 acres in upper Lake Marion for the third straight year. This year hydrilla was found in Lake Wateree for the first time resulting in unplanned treatments to attempt to eliminate it.

In 1995, a total of \$2,804,206 were expended for aquatic plant control activities on 30 water bodies. Fifty percent of the funding was provided by the U.S. Army Corps of Engineers, 44 percent was provided by local sponsors, and the state contributed 6 percent. Some level of herbicide treatment occurred on all the water bodies totaling about 9,710 acres at a cost of \$2,367,622. A total of 97,526 grass carp were stocked in five lakes at a total cost of \$435,084. Most of these were stocked in the Santee Cooper lakes (91,000) and Goose Creek Reservoir (6,000). Hydrilla was found in Lake Keowee for the first time this year which resulted in an unplanned treatment. Also *Salvinia molesta*, a federal noxious weed, was discovered in a private pond in Colleton County. Efforts were made to eradicate the infestation with treatments by the landowner and the state. Grass carp continue to provide excellent control in over 9,000 acres in upper Lake Marion; however, floating water hyacinths now infest much of this area impacting primarily shoreline and swamp areas.

Control expenditures in 1996 were about one-half of those in 1995 due in part to successful results from control efforts in previous years and in part to reductions in federal funding. A total of 19 water bodies were managed for nuisance species at a total cost of \$1,151,501; the Corps of Engineers provided 31%, the State provided 10%, and local entities provided 59%. Herbicide treatments were conducted in 4,920 acres at a cost of \$888,685; biocontrol agents were used in four lakes at a cost of \$262,816. Hydrilla coverage on the Santee Cooper lakes (Lakes Marion and Moultrie) declined by almost 80% due apparently to the successful stocking of sterile grass carp. As a result, herbicide treatments of hydrilla were reduced by a comparable amount. Hydrilla coverage has been essentially eliminated on Lake Wateree and substantially reduced on Lake Keowee through a combination of herbicide treatments and drawdowns. A large drawdown and treatment on Lake Murray this year is hoped to have similar results.

During 1997, aquatic plant management operations were conducted on 21 water bodies at a total cost of \$459,783. This represents a 60% reduction from control costs in 1996 due to very successful hydrilla management efforts on the Santee Cooper lakes and Lake Murray coupled with limited Federal matching funds. Matching funds from the Corps of Engineers composed only 2 percent of total costs, while State and Local funds made up 38 percent and 60 percent, respectively. Sterile grass carp were stocked in five lakes to control 292 acres of submersed plants at a cost of \$15,951.

Aquatic herbicides were used to treat 3,762 acres at a total cost of \$443,832. Most herbicide treatments (58%, 2,181 acres) were focused on water hyacinth which has expanded its range and now is found on six major water bodies. Water hyacinth treatments on the Ashepoo River were greater than originally planned and treatments on the Waccamaw River were unanticipated. Hydrilla coverage on the Santee Cooper lakes continued to decline in 1997 due to successful control by sterile grass carp resulting in sharp reductions in management expenditures. The drawdown and herbicide treatment on Lake Murray in 1996 resulted in better than anticipated hydrilla control this year. Hydrilla acreage was reduced 88 percent with a 45 percent reduction in shoreline miles.

Limited hydrilla coverage on the Santee Cooper Lakes, Lake Murray and Goose Creek Reservoir during 1998 helped reduce overall control expenditures for the third consecutive year. Total control cost for 1998 were 40% less than in 1997. A total of 1,862 acres on 17 water bodies were managed at a cost of \$273,223. The Department of Natural Resources provided 47% of total funding, while 25% was provided by the Corps of Engineers, and 28% by various local entities. Sterile grass carp are effectively controlling hydrilla growth in the Santee Cooper Lakes and Goose Creek Reservoir. About one-half of all herbicide treatments (940 ac.) were focused on water hyacinth control on coastal rivers and impoundments.

A total of 3,259 acres on 19 water bodies were managed in 1999 at a total cost of \$453,071. Funding support was 34% State (SCDNR), 21% Federal (USACOE), and 45% local match. Most herbicide treatments (1506 acres, 46%) were directed at controlling the growth of water hyacinth in seven water bodies. Hydrilla growth remains limited statewide due to control operations in previous years. Grass carp in the Santee Cooper Lakes (Lakes Marion and Moultrie) and Goose Creek Reservoir are effectively controlling hydrilla growth in those lakes. Hydrilla regrowth was evident in Lake Murray at the end of the year; however, higher than normal lake levels restricted herbicide treatments. Therefore, significant regrowth is expected next year.

During 2000, aquatic plant management operations were conducted on 21 water bodies at a total cost of \$483,236. State budget cuts at the end of the calendar year reduced control efforts by 21% of planned expenditures and shifted costs to local sponsors. Seventy percent of total costs were borne by local entities with the state paying the rest. Most of the control effort was focused on water hyacinth (31%), followed by hydrilla (25%) and Pithophora (19%). Hydrilla regrowth was significant on Lake Murray as predicted. Grass carp continue to control hydrilla on Goose Creek Reservoir and Lake Marion and Lake Moultrie.

During 2001, aquatic plant management operations were conducted on 2,775 acres on 25 water bodies at a total cost of \$508,075. Due to State budget cuts virtually all control costs were paid for with federal (41%) and local funds (59%). Hydrilla treatments were up this year (1,550 acres) because of a resurgence of hydrilla growth on Lake Murray; however, water hyacinth treatments were especially low (186 acres) due to a very cold period in December. Grass carp continue to provide effective control of hydrilla on Goose Creek Reservoir and the Santee Cooper Lakes.

During 2002, aquatic plant management operations were conducted on 2,239 acres on 17 water bodies at a total cost of \$297,236. Due to State budget cuts virtually all control costs were paid for with federal (37%) and local funds (63%). Water hyacinth treatments were up this year (1,186 acres)

because of a milder than normal winter; however, hydrilla treatments were especially low (390 acres) due to the inability to treat Lake Murray. Grass carp continue to provide effective control of hydrilla on Goose Creek Reservoir and the Santee Cooper Lakes.

In 2003, aquatic plant management operations were conducted on 61340 acres in 12 water bodies at a total cost of \$639,328. Due to state budget cuts all control costs were paid for with federal (38%) and local funds (62%). Included in this total are the stocking of 64,500 sterile grass carp in Lake Murray to control 4300 acres of hydrilla at a cost of \$369,529. About 57% of all herbicide treatments (1005 ac.) were focused on water hyacinth control on coastal rivers and impoundments. Grass carp continue to provide effective control of hydrilla on Goose Creek Reservoir and the Santee Cooper Lakes.

A total of 2764 acres were treated in 2004 at a total cost of \$470,815. Local sponsors provided 41% of the cost, while the Corps of Engineers provided 30%. Funds from the State's Water Recreational Resource Fund (boat gas tax) paid for 29% of all control costs. The focus of most control was on water hyacinth (931 acres) and Phragmites (710 acres). Grass carp continue to provide effective control of hydrilla on Goose Creek Reservoir and the Santee Cooper Lakes. Preliminary surveys of Lake Murray indicate that grass carp stocked in 2003 are beginning to provide some control of hydrilla. The drawdown on Lake Murray over the past two years is also providing good hydrilla control in the drawdown zone.

In 2005 the focus of the Aquatic Nuisance Species Program was Phragmites control in coastal South Carolina, 1983 acres were treated at a cost of \$349,174. In all, a total of \$655,535 was spent on 3,935 acres of control of invasive plants. Local sponsors provided 32% of the cost, while the Corps of Engineers provided 35%. Funds from the State's Water Recreational Resource Fund (boat gas tax) paid for 33% of all control costs. Grass carp continue to provide effective control of hydrilla on the Santee Cooper Lakes and have provided excellent control on Lake Murray.

For 2006, Phragmites control was center stage and once again led the control efforts with 1950 acres treated at a cost of \$352,804. This is second only to last year's acreage of phragmites treated. In total 3983 acres of invasive species were treated at a cost of \$722,316. Funding from the Corps of Engineers was not available this year and the costs were almost evenly split between the local cost share monies and Water Recreation funds. Additional funding was used from the U.S. Navy, Naval Weapons Station in Goose Creek. Included in that total was 242 acres of Phragmites and about 70 acres of pond work in the Marrington Recreation area. Findings in Goose Creek Reservoir and the Santee Cooper Lakes indicate that additional stockings of triploid grass carp may need to be reconsidered in 2007.

Increasing hydrilla and the abundance of native submersed vegetation in 2007 brought about maintenance stocking of Triploid Grass Carp in Lake Marion, Lake Moultrie, and Goose Creek Reservoir. A total of 2620 sterile carp were stocked in the Santee Cooper Lakes with an additional 185 fish stocked into Goose Creek Reservoir. In total 4208 acres of invasive species were treated at a cost of \$773,263. Costs were almost evenly split between the local cost share monies and Water Recreation funds. Additional funding was used from the U.S. Navy, Naval Weapons Station in Goose Creek and U. S. Army Corps of Engineers for treatment of phragmites on spoil areas in Charleston

Harbor and the Intracoastal Waterway. Santee coastal WMA managers should now have gained the upper hand with an additional 714 acres treated on Santee Coastal. Yawkey continued treatment of phragmites (120 acres) with several problem areas which remain persistent throughout treatment. Additionally 904 acres of phragmites have been treated from Colleton County through Georgetown County.

2008 showed a rebound of hydrilla across the state. Hydrilla was discovered in several new sites and at some old sites this highly invasive species increased abundantly. Triploid grass carp maintenance stocking plans are being reconsidered because of the increased levels of hydrilla in the Santee Cooper Lakes and Goose Creek Reservoir. Cooperative efforts with Duke Energy, Lake Wylie Marine Commission, South Carolina DNR, and North Carolina wildlife agencies produced a management plan for the border lake, Lake Wylie. 3335 acres of invasive species were treated at a cost of \$641,791. Costs were split approximately 44% local cost share monies and 56% Water Recreation funds. Phragmites sites continued to decline in acreage and new cooperative agreements were put in place for water hyacinth control on public and private areas along the Pee Dee and Waccamaw Rivers. This agreement includes SCDNR, the U.S. Fish and Wildlife Service, the Nature Conservancy, and private landowners. New problems tackled by the ANS program include a highly invasive snail species in the Socastee area of Horry County (111 acres at \$3,671) and a toxic algae problem in Hopeland Gardens in Aiken, S.C.

Budget problems in 2009 limited state level cost-share. In all 65% of total costs for control in South Carolina was absorbed by the local entities, along with 35% State Water Recreational Resource funds and 2% Federal funds. Through innovative control measures and perseverance by ANS staff, control efforts were not severely hampered. Triploid grass carp were stocked for the first time in Lake Greenwood to control an ever increasing hydrilla population. This stocking had limited success as hydrilla numbers grew throughout the summer months to double the original acreage.

Maintenance stocking of the Santee Cooper Lakes and Goose Creek Reservoir was accomplished. In 2009 2,867 acres of control work was done at a total cost of \$572,588. Santee Cooper control was about 38% of the total acreage treated. Phragmites control was a key component of habitat restoration for waterfowl and other species and resulted in 424 acres of control efforts which is down from previous years because of efficacy of previous control efforts.

During FY 2010, aquatic plant management operations by the ANS Program were conducted on 28 different management sites at a cost of \$271,003 using local and State Water Recreation Resource funds. Field operation expenditures for the SCDNR decreased by 2% from FY 2009-2010 while acres controlled (2091, +18%) increased. This occurred by utilizing more efficient survey and treatment schedules along with the increased efficacy of newer herbicides brought about by a renewed state contract. Budget problems in 2010 limited state level cost-share. In all, 42% of total costs for control in South Carolina were absorbed by the local entities along with 58% State Water Recreational Resource funds. Through innovative control measures and perseverance by ANS staff, control efforts were not severely hampered. Triploid grass carp stocked in Lake Greenwood had good success as hydrilla acreage numbers plummeted to near zero. Maintenance stocking of the Santee Cooper Lakes and Goose Creek Reservoir was accomplished; with results in Goose Creek

Reservoir showing decreased submerged invasives and the results are pending based on aerial GIS surveys to be completed on Santee Cooper. 2,091 acres of control work was done in state waters. Habitat restoration for waterfowl and other species continues on Santee Coastal, Yawkey, Samworth, Donnelley, and Santee Delta. Early reports from those areas show an increase in useable habitat for waterfowl with increased bird numbers. Santee Cooper, which received no cost share funding, completed 2,438 acres at a cost of \$785,621. Acreage increases statewide and on Santee Cooper are almost entirely based on significant expansion of two new highly invasive species, *Nymphoides cristata* (crested floating heart) and *Pomacea insularum* (Island Applesnail). In all 4,519 acres of invasives were treated in South Carolina public waters at a total cost of \$1,056,624.

Hydrilla showed a 160 % increase in acreage on the Santee Cooper Lakes in 2011 prompting the Council to forego the maintenance stocking approach for an adaptive management strategy. The new plan calls for a total number of 109,000 triploid grass carp to be stocked in 2013 to reach a target rate of 129,000 carp. Aquatic plant management operations were conducted on 27 different management sites at a cost of \$201,849 using local and State Water Recreation Resource funds. Field operation expenditures for the SCDNR decreased by 26% from FY 2010, while acres controlled was 1228. Phragmites control is a key component of habitat restoration for waterfowl and other species and resulted in 390 acres of control efforts which is down from previous years because of efficacy of previous control efforts and the fact that the phragmites population has been reduced to mostly scattered pods. The cooperative effort to control the spread of the highly invasive Island apple snail appears to have continued success as populations continue to decline and expansion has not materialized.

In 2012 Hydrilla on the Santee Cooper Lakes increased again to 7210 acres up from 3244 acres in 2011. While this was occurring native submerged species acreage numbers also increased to 9.2 % coverage of the total 160,000 acre system. Lake Greenwood and Murray are still stable with no reported growth of hydrilla and will not require stocking in 2012. Several other areas, mostly in the upstate region, of the state have experience an increase in hydrilla growth and were treated accordingly. In all Santee Cooper and SCDNR expended \$1.15 million for control of 4929 acres of invasive species.



**Table 2012-A. Summary of Expenditures by Source for Control Operations During 2012.**  
**(NOTE: This table needs revision based on Incomplete tabulation, still in progress)**







**Table 2011-A. Summary of Expenditures by Source for Control Operations During 2011.**

	Water Body Name	Total Cost	Local	State	Federal	Local Sponsor
1	ACE Basin	\$92	\$46	\$46	\$0	SCDNR, USF&W
2	Back River Reservoir	\$25,733	\$12,867	\$12,867	\$0	SCE&G, CPW
3	Black Mingo Creek	\$59	\$29	\$29	\$0	Georgetown Co.
4	Bonneau Ferry WMA	\$2,373	\$1,186	\$1,186	\$0	SCDNR
5	Caw Caw Park	\$341	\$170	\$170	\$0	Charleston Parks
6	Cooper River	\$15,687	\$7,844	\$7,844	\$0	Berkeley Co.
7	Georgetown Parks	\$1,625	\$813	\$813	\$0	Georgetown Co.
8	Goose Creek Reservoir	\$25,707	\$12,854	\$12,854	\$0	CPW
9	Horry County	\$22,626	\$11,313	\$11,313	\$0	SCDNR(IAS)
10	Lake Cunningham	\$400	\$200	\$200	\$0	Greer CPW
11	Lake Greenwood	\$0	\$0	\$0	\$0	Greenwood Co.
12	Misc	\$5,566	\$2,783	\$2,783	\$0	SCDNR
13	Morris village	\$4,813	\$2,406	\$2,406	\$0	SCDNR
14	Samworth	\$4,029	\$2,015	\$2,015	\$0	SCDNR
15	Santee Coastal Reserve	\$49,494	\$24,747	\$24,747	\$0	SCDNR
16	Santee Delta	\$879	\$440	\$440	\$0	SCDNR
17	US Naval Weapons Sta.	\$0	\$0	\$0		US Navy
18	Waccamaw River	\$0	\$0	\$0	\$0	Georgetown Co.
19	Yawkey	\$2,786	\$1,393	\$1,393	\$0	SCDNR
<b>Santee Cooper Lakes</b>						
20	Lake Marion	\$421,997	\$421,997	\$0	\$0	Santee Cooper
21	Lake Moultrie	\$159,297	\$159,297	\$0	\$0	Santee Cooper
	Sub Impoundments	\$204,327	\$204,327	\$0	\$0	Santee Cooper
<b>State Parks</b>						
22	Aiken SP	\$4,003	\$2,002	\$2,002	\$0	SCPRT
23	Barnwell SP	\$9,101	\$4,550	\$4,550	\$0	SCPRT
24	Charlestown Landing SP	\$83	\$42	\$42	\$0	SCPRT
25	Goodale SP	\$5,655	\$2,828	\$2,828	\$0	SCPRT
26	Huntington Beach SP	\$609	\$305	\$305	\$0	SCPRT
27	Kings Mountain SP	\$1,579	\$789	\$789	\$0	SCPRT
28	Lee	\$1,143	\$572	\$572	\$0	SCPRT
29	Little Pee Dee SP	\$6,016	\$3,008	\$3,008	\$0	SCPRT
30	Poinsett SP	\$2,426	\$1,213	\$1,213	\$0	SCPRT
31	Sesquicentennial SP	\$9,024	\$4,512	\$4,512	\$0	SCPRT
<b>SCDNR Total</b>		<b>\$162,211</b>	<b>\$81,105</b>	<b>\$81,105</b>	<b>\$0</b>	
<b>State Park Lake Total</b>		<b>\$39,639</b>	<b>\$19,820</b>	<b>\$19,820</b>	<b>\$0</b>	
<b>Santee Cooper Total</b>		<b>\$785,621</b>	<b>\$785,621</b>	<b>\$0</b>	<b>\$0</b>	
<b>Grand Total</b>		<b>\$987,471</b>	<b>\$886,546</b>	<b>\$100,925</b>	<b>\$0</b>	

Table 2011-8 Summary of S.C. Aquatic Nuisance Species Control Operations and Expenditures During 2011								
Waterbody	Target/Plants	Acres	Total Cost	Cost/Acre	Control/Agent	Rate	Management/Objective	Control/Effectiveness
1 Ace Basin	Phragmites	0.50	\$92.16	\$184.32	Habitat/Glyphosate	0.750 gal/ac-0.750 gal/ac	Reduce phragmites to enhance waterfowl habitat, public access and use.	> 95% control
2 Back River Reservoir	Hydrilla	64.00	\$15,224.36	\$237.88	Komeen/Komeen-Reward	16 gal/ac/4 gal/ac-2gal/ac	Reduce problem plants to enhance public access, use, water quality, and maintain electric power generation and minimize impacts to water intakes.	> 95% control Reward/Komeen mix proved to be more effective
	Water hyacinth	140.00	\$10,508.76	\$75.06	Renovate/Reward/ Habitat/Glyphosate	0.250 - 0.500 gal/ac		90% control
3 Black Mingo Creek	Aligatorweed, Pennywort	204.00	\$25,733.12	\$126.14	Habitat	0.500 gal/ac	Reduce problem plants to enhance waterfowl habitat, public access and use.	> 95% control
4 Bonneau Ferry Misc Ponds & Reservoirs	Water Primrose, Water hyacinth, Frog's bit, Lotus, Cutgrass, Cattails	28.20	\$2,372.72	\$84.14	Habitat/Glyphosate	0.500gal/ac - 0.500gal/ac	Reduce problem plants to enhance waterfowl habitat, public access and use.	>60% control
5 Caw Caw Natural Area	Phragmites	2.00	\$153.48	\$76.74	Habitat/Glyphosate	0.500gal/ac - 0.500gal/ac	Reduce phragmites to enhance waterfowl habitat, public access and use.	>90% control
	Phragmites	1.00	\$187.44	\$187.44	Clearcast	1 gal/ac	Reduce problem plants to enhance waterfowl habitat, public access and use.	>95% control
6 Cooper River	Hydrilla	3.00	\$340.92	\$113.64				
	Hydrilla	37.39	\$12,225.46	\$326.97	Komeen/Nautique/Reward	16 gal/ac/10 gal/ac/4 gal/ac/ 4 gal/ac	Provide boat trails to main channel through hydrilla. Reduce problem plants to enhance public access and use.	> 95% control
	Water hyacinth	21.00	\$1,580.56	\$75.26	Habitat/Glyphosate	0.250 gal/ac-0.250 gal/ac		> 95% control
	Water primrose	25.00	\$1,881.06	\$75.24	Habitat/Clearcast/Glyphosat	0.250 gal/ac-0.500 gal/ac		> 95% control
	TOTAL:	83.39	\$15,687.08	\$188.12				
7 Georgetown Parks	Phragmites	14.00	\$1,625.24	\$116.09	Habitat/Clearcast/Glyphosat	0.500 gal/ac - 0.750 gal/ac	Reduce phragmites to enhance waterfowl habitat, public access and use.	90% control
8 Goose Creek Reservoir	Water hyacinth, Water lettuce	14.00	\$1,625.24	\$116.09				
	Water hyacinth, Water lettuce	181.50	\$20,630.23	\$113.67	Habitat/Clearcast/Reward/ Galleon/Glyphosate	0.1875 gal/ac-0.750 gal/ac	Reduce water hyacinth & water lettuce to greatest extent possible.	> 95% control
	Watermeal	1.50	\$935.11	\$623.41	Galleon/Sonar	0.208 gal/ac 0.104 gal/ac	Reduce problem plants to enhance public access, use and water quality.	> 95% control
	Water primrose	9.00	\$342.61	\$38.07	Clearcast	0.500 gal/ac		90% control
	Hydrilla	33.00	\$3,085.50	\$93.50	Triploid Grass Carp	870		> 80% control
	Hydrophila	1.00	\$713.60	\$713.60	Clearcast	2 gal/ac		
	TOTAL:	226.00	\$25,707.05	\$113.75				
9 Horry County	Island Applesnails	183.84	\$22,626.24	\$123.08	Copper	up to 0.05 ppm	Eradicate or reduce problem-matic snail populations to protect human health and sensitive areas	>60% control
10 Lake Cunningham	Lotus, spatterdock	183.84	\$22,626.24	\$123.08				
	Lotus, spatterdock	2.00	\$400.00	\$200.00	Habitat	0.250 gal/ac	Reduce problem plants to enhance public access, use and water quality.	90% control
11 Morris Village	Watermilfoil	2.00	\$400.00	\$200.00				
	Watermilfoil	8.00	\$4,812.80	\$601.60	Renovate Max G	200 lbs/ac	Reduce problem plants to enhance public access, use and water quality.	90% control
12 Misc	Hydrilla	4.00	\$374.00	\$93.50	Triploid Grass Carp	100	Reduce problem plants to enhance public access, use and water quality.	90% control
	Hydrilla	4.00	\$5,192.00	\$1,298.00				
	TOTAL:	4.00	\$5,566.00	\$1,391.50				
13 Santee Coastal Reserve	Phragmites	329.00	\$49,493.40	\$150.44	Habitat/Glyphosate	0.750 gal/ac/0.750 gal/ac	Reduce phragmites to enhance waterfowl habitat, public access and use.	90% control
14 Santee Delta WMA	Phragmites	329.00	\$49,493.40	\$150.44				
	Phragmites	6.00	\$879.16	\$146.53	Habitat/Glyphosate	0.750 gal/ac/0.750 gal/ac	Reduce problem plants to enhance waterfowl habitat, public access and use.	95% control
	TOTAL:	6.00	\$879.16	\$146.53				
15 Samworth WMA	Water hyacinth	30.00	\$4,029.00	\$134.30	Habitat/Glyphosate	0.500 gal/ac/0.500 gal/ac	Reduce hyacinth to minimize spread and impacts to public access and use.	95% control
16 Yawkey	Phragmites, cattails	30.00	\$4,029.00	\$134.30				
	Phragmites, cattails	28.00	\$2,786.28	\$99.51	Habitat/Glyphosate	0.250 gal/ac-0.750 gal/ac	Reduce phragmites and problem plants to enhance waterfowl habitat, public access and use.	>90% control
	TOTAL:	28.00	\$2,786.28	\$99.51				

Waterbody	TargetPlants SCDNR TOTAL:	Acres	TotalCost	Cost/Acre	Control/Agent	Rate	Management/Objective	Control/Effectiveness
<b>17 Lake Marion</b>		1151.43	\$162,210.12	\$140.88				
	American Lotus	2.0	\$510.44	\$255.22	Touchdown PRO, Renovate 3, Renovate MAX G	.75 gal/ac, .50 gal/ac, 150 - 200 lbs/ac	Provide access to open water and shoreline areas for public use	>95% control of plant at end of season
	Vallisneria	9.3	\$4,075.43	\$440.59	Hydrothol 191 Liquid, Nautique	5.0 gal/ac, up to 10.0 gal/ac	Provide access to open water and shoreline areas for public use	85% control of plant after treatment
	Crested Floating Heart	1686.0	\$502,149.39	\$321.56	Aquathol K Liquid, Clearcast, Touchdown PRO, Renovate MAX G, Sonar Q, Sonar PR	2.5 - 7.0 gal/ac, 1.0 gal/ac / 0.5 gal/ac, 150 - 300 lbs/ac, 14.0 lbs/ac, 3.25 lbs/ac	Provide access to open water and shoreline areas for public use and prevent spread to other areas of the lake	>95% in shallow coves with Aquathol K 80% in open water areas with Clearcast / Touchdown PRO. 100% in quiescent cove with Sonar.
	Chara	44.0	\$4,864.95	\$110.57	Captain, Cygnet Plus, Captain XTR	4.0 - 5.0 gal/ac, 2.0 - 5.0 gal/ac	Reduce problem plants in residential area where navigation and recreation is adversely affected.	>95% control of plant at end of season
	Giant Cutgrass, Cattail	7.8	\$890.98	\$114.97	Habitat, Touchdown PRO	0.25 gal/ac, 0.50 gal/ac	Reduce plant encroachment on lake-front property and public access areas. Restoration of waterfowl habitat.	100% control of plant at end of season
	Hydrilla	70.0	\$35,188.40	\$502.69	Aquathol K Liquid, Nautique	6.0 - 8.0 gal/ac, 1.0 gal/ac	Reduce problem plant population to prevent spread to other areas of the lake. Maintain level until adequate grass carp population from restocking can maintain control	>90% control of plant after treatment
	Lyngbya, Pithophora	38.1	\$7,122.35	\$186.94	Captain, Cygnet Plus, Captain XTR, Cutrine Ultra	4.0 - 6.0 gal/ac, 0.5 gal/ac, 4.0 - 6.0 gal/ac	Reduce algal mats to enhance recreational use of water	90% control of plant at end of season
	Water Primrose, Alligatorweed	52.0	\$16,483.64	\$316.99	Clearcast, Touchdown PRO, Renovate MAX G	.5 gal/ac, 25 gal/ac, 150 - 200 lbs/ac	Reduce shoreline plant populations to enhance recreation and navigation	~75% control of plant at end of season. Some late season regrowth noted.
	Water Willow	35.3	\$4,687.17	\$132.97	Renovate 3	.375 gal/ac	Reduce problem plants in residential areas where navigation and recreation is adversely affected.	~85% control of plant at end of season
	Pondweed	3.4	\$1,375.57	\$410.62	Aquathol K, Captain	5.0 - 9.0 gal/ac, 0.95 gal/ac	Reduce problem plants in residential areas where navigation and recreation is adversely affected.	~75% control of plant at end of season
	Duckweed	0.25	\$125.42	\$501.68	Reward	1.0 gal/ac	Reduce plant population to prevent spread to other quiescent areas of the lake	90% control of plant at end of season
	<b>TOTAL:</b>	1948	\$617,473.74	\$316.99				
<b>18 Lake Moultrie</b>		9.6	\$1,634.67	\$170.28	Renovate	0.5 gal/ac	Reduce problem plants in residential areas where recreation is adversely affected	>95% control of plant at end of season
	Fragrant Water Lily	2.8	\$464.44	\$168.89	Touchdown PRO	1.0 gal/ac	Reduce problem plants in residential area where recreation is adversely affected	>95% control of plant at end of season
	Vallisneria	0.5	\$331.41	\$662.82	Nautique, Cygnet Plus	Up to 10.0 gal/ac, 0.25 gal/ac	Provide access to open water areas for public use.	85% control of plant at end of season, treatment site now de-watered
	Crested Floating Heart	7.8	\$2,982.06	\$384.78	Clearcast, Touchdown PRO, Renovate MAX G	1.0 gal/ac / 0.5 gal/ac, 150 - 300 lbs/ac	Remove problem plants adjacent to boat landing to prevent spread to other areas of lake	>95% control of plant at end of season (in canal area only)
	Cabomba	9.0	\$6,659.08	\$739.90	Clipper	5.0 lbs/ac	Reduce problem plants in residential areas where recreation is adversely affected	100% control of plant after treatment
	Giant Cutgrass, Cattail	0.8	\$135.37	\$180.49	Habitat / Touchdown PRO	0.25 gal/ac / 0.50 gal/ac	Reduce problem plants in residential area where recreation is adversely affected	100% control of plant at the end of season
	Hydrilla	450.0	\$221,263.79	\$491.70	Aquathol K Liquid, Nautique	7.0 gal/ac, 1.0 gal/ac	Reduce problem plant population to prevent spread to other areas of the lake. Maintain level until adequate grass carp population from restocking can maintain control	90% control of plant after treatment
	Lyngbya, Pithophora, Spirogyra	5.5	\$1,363.30	\$247.87	Captain, Cygnet Plus, Captain XTR, Cutrine Ultra	4.0 - 6.0 gal/ac, 0.5 gal/ac, 4.0 - 6.0 gal/ac (XTR, Ultra)	Reduce algal mats on shoreline and in dead-end coves where navigation and recreation is adversely affected	85% control of plant after treatment

Waterbody	TargetPlants	Acres	TotalCost	Cost/Acre	Control/Agent	Rate	Management/Objective	Control/Effectiveness
	Chara	0.5	\$84.70	\$169.40	Captain XTR	2.5 gal/ac	Reduce problem plant population to provide public and shoreline access.	90% control of plant after treatment
	Water Primrose, Alligatorweed	27.6	\$11,565.15	\$419.79	Clearcast, Touchdown PRO, Renovate MAX G	.5 gal/ac, 25 gal/ac, 200 - 300 lbs/ac	Reduce problem plants in residential areas where recreation is adversely affected	~75% control of plant at end of season. Some late season regrowth noted.
	Water Willow	0.25	\$55.82	\$223.28	Renovate 3	.375 gal/ac	Reduce problem plants in residential areas where recreation is adversely affected	90% control of plant at end of season
	Slender Naiad	1.5	\$274.52	\$183.01	Nautique, Cygnet Plus	5.0 gal/ac, 0.25 gal/ac	Reduce problem plants in residential area where recreation is adversely affected.	100% control after treatment, area now de-watered
	Pondweed	1.5	\$407.30	\$271.53	Nautique, Cygnet Plus	5.0 gal/ac, 0.25 gal/ac	Reduce problem plants in residential area where recreation is adversely affected.	80% control after treatment
	Milfoil	8.3	\$5,356.55	\$645.37	Clipper, Renovate MAX G	5.0 lbs/ac, 80 - 200 lbs/ac	Reduce problem plants in residential area where recreation is adversely affected.	90% control of plant at end of season
	<b>TOTAL:</b>	<b>52.5</b>	<b>\$252,578.16</b>	<b>\$480.69</b>				
<b>Taw Caw Impoundment</b>	Hydrilla	171.0	\$29,897.34	\$174.84	Sonar One	6.5 lbs/ac	Reduce plant population to provide public access to shoreline, coves and open water areas and prevent spread of plant to other areas of the lake.	>95% control of plant at the end of season
	Water Primrose, Alligatorweed	2.5	\$574.10	\$229.64	Clearcast, Touchdown PRO	.5 gal/ac, 25 gal/ac	Reduce problem plant population to provide public and shoreline access	~75% control of plant at end of season. Some late season regrowth noted.
	Giant Cutgrass, Cattail	1.0	\$191.37	\$191.37	Habitat / Touchdown PRO	.25 / .50 gal/ac	Reduce plant encroachment on lake-front property and public access areas.	No Treatment
	<b>TOTAL:</b>	<b>174.5</b>	<b>\$30,662.81</b>	<b>\$175.72</b>				
<b>Potato Creek Impoundment</b>	Hydrilla	145.0	\$26,714.42	\$184.24	Sonar One	6.8 lbs/ac	Reduce plant population to provide public access to shoreline, coves and open water areas and prevent spread of plant to other areas of the lake.	>95% control of plant at the end of season
	<b>TOTAL:</b>	<b>145.0</b>	<b>\$26,714.42</b>	<b>\$184.24</b>				
<b>Dean Swamp Impoundment</b>	Hydrilla	116.0	\$16,412.30	\$141.49	Sonar One	5.2 lbs/ac	Reduce plant population to provide public access to shoreline, coves and open water areas and prevent spread of plant to other areas of the lake.	>95% control of plant at the end of season
	Water Primrose, Alligatorweed	5.0	\$927.40	\$185.48	Clearcast, Touchdown PRO	.5 gal/ac, 25 gal/ac	Reduce problem plant population to provide public and shoreline access	~85% control of plant at end of season. Some late season regrowth noted.
	Lyngbya, Pithophora	18.0	\$3,472.56	\$192.92	Captain, Cygnet Plus, Captain XTR, Cutrine Ultra	4.0 - 6.0 gal/ac, 0.5 gal/ac, 4.0 - 6.0 gal/ac (XTR, Ultra)	Remove algae to improve access and use of water for property owners.	~75% control of algal mats at end of season.
	<b>TOTAL:</b>	<b>139.0</b>	<b>\$20,812.26</b>	<b>\$149.73</b>				
<b>Church Branch Impoundment</b>	Cabomba	3.7	\$2,768.01	\$748.11	Clipper	5.4 lbs/ac	Reduce plant population to provide public access to shoreline, coves and open water areas and prevent spread of plant to other areas of the lake.	100% control of plant at the end of season.
	Water Primrose, Alligatorweed	1.3	\$260.99	\$208.79	Clearcast, Touchdown PRO	.5 gal/ac, 25 gal/ac	Reduce problem plant population to provide public and shoreline access	~90% control of plant at end of season. Some late season regrowth noted.
	Fragrant Water Lily	2.0	\$1,590.19	\$795.10	Glyphosate, Renovate	.75 gal/ac, .50 gal/ac	Provide access to open water and shoreline areas for public use	No Treatment
	Lyngbya, Pithophora	10.5	\$1,918.82	\$182.74	Captain, Cygnet Plus, Captain XTR, Cutrine Ultra	4.0 - 6.0 gal/ac, 0.5 gal/ac, 4.0 - 6.0 gal/ac (XTR, Ultra)	Remove algae to improve access and use of water for property owners.	~75% control of plant at end of season. Some late season regrowth noted.
	Water Milfoil	4.0	\$3,180.39	\$795.10	Renovate	.50 - 1.0 gal/ac	Reduce problem plant population to provide public and shoreline access	~85% control of plant in areas treated at end of season
	Slender Naiad	20.0	\$5,845.06	\$292.25	Aquathol K Liquid	5 - 6 gal/ac	Eliminate plant population to provide public access to coves and open water areas and prevent spread to other areas of lake	<50% reduction of plant biomass in areas treated at the end of season.



Waterbody	TargetPlants	Acres	TotalCost	Cost/Acre	Control/Agent	Rate	ManagementObjective	ControlEffectiveness
	Pondweed	30.0	\$8,767.60	\$292.25	Aquathol K Liquid, Nautique	4.75 gal/ac, 0.6 gal/ac	Reduce problem plant population to provide public and shoreline access	~70% control of plant at end of season. Some late season regrowth noted.
	Water Shield	0.8	\$104.84	\$139.79	Touchdown PRO	1.0 gal/ac	Remove plants to improve access and use of water for property owners.	>95% control of plant in areas treated at end of season
	<b>TOTAL:</b>	<b>72.2</b>	<b>\$24,435.90</b>	<b>\$338.45</b>				
<b>Fountain Lake Impoundment</b>	<b>Chara</b>	<b>1.0</b>	<b>\$310.47</b>	<b>\$310.47</b>	<b>Captain, Cygnet Plus</b>	<b>4.0 gal/ac, 1.0 gal/ac</b>	<b>Remove algae to improve access and use of water for property owners.</b>	<b>&gt;95% control of plant in areas treated at end of season</b>
	Water Primrose, Alligatorweed	2.0	\$404.96	\$202.48	Clearcast, Touchdown PRO	.5 gal/ac, .25 gal/ac	Reduce problem plant population to provide public and shoreline access	~75% control of plant at end of season. Some late season regrowth noted.
	Fragrant Water Lily	1.0	\$304.61	\$304.61	Clearcast, Touchdown PRO	.5 gal/ac, .25 gal/ac	Provide access to open water and shoreline areas for public use	>95% control of plant in areas treated at end of season
	Lyngbya, Pithophora	4.0	\$496.91	\$124.23	Captain, Cygnet Plus	4.0 gal/ac, 1.0 gal/ac	Remove algae to improve access and use of water for property owners.	Remove algae to improve access and use of water for property owners.
	Pondweed	5.0	\$1,427.32	\$285.46	Nautique	2.5 gal/ac	Eliminate plant population to provide public access to coves and open water areas and prevent spread to other areas of lake	~75% control of plant at end of season. Some late season regrowth noted.
	Water Shield	3.0	\$913.85	\$304.62	Clearcast, Touchdown PRO	.5 gal/ac, .25 gal/ac	Provide access to open water and shoreline areas for public use	>95% control of plant in areas treated at end of season
	<b>TOTAL:</b>	<b>16.0</b>	<b>\$3,858.12</b>	<b>\$241.13</b>				
<b>SC State Parks</b>	<b>SANTEE COOPER TOTAL:</b>	<b>3020.10</b>	<b>\$976,535.41</b>	<b>\$323.35</b>				
19 <b>Allen</b>	Floating heart, watermilfoil	7.00	\$4,003.20	\$571.89	Renovate Max G	200 lbs/ac	Reduce problem plants to enhance public access, use and water quality.	>95% control
20 <b>Barnwell</b>	Water lily, cattails	16.00	\$9,100.74	\$568.80	Habitat/Glyphosate/ Renovate Max G	0.500 gal/ac/0.500 gal/ac 200 lbs/ac	Reduce problem plants to enhance public access, use and water quality.	>95% control
21 <b>Charlestown Landing</b>	Pennywort	1.00	\$83.20	\$83.20	Renovate 3	0.500 gal/ac	Reduce problem plants to enhance public access, use and water quality.	95% control
22 <b>Goodale</b>	Watermilfoil	9.40	\$5,655.04	\$601.60	Renovate Max G	200 lbs/ac	Reduce problem plants to enhance public access, use and water quality.	95% control
23 <b>Huntington Beach</b>	Phragmites	9.25	\$609.32	\$65.87	Habitat/Glyphosate Clearcast	0.750 gal/ac 0.750 gal/ac	Reduce problem plants to enhance public access, use and water quality.	95% control
24 <b>Kings Mountain</b>	Naiad	3.00	\$1,578.57	\$526.19	Aquathol K	8.330 gal/ac	Reduce problem plants to enhance public access, use and water quality.	95% control
25 <b>Lee</b>	Watermilfoil	1.90	\$1,143.04	\$601.60	Renovate Max G	200 lbs/ac	Reduce problem plants to enhance public access, use and water quality.	95% control
26 <b>Little Pee Dee</b>	Watermilfoil	10.00	\$6,016.00	\$601.60	Renovate Max G	200 lbs/ac	Reduce problem plants to enhance public access, use and water quality.	95% control
27 <b>Poinsett</b>	Alligatorweed, Watermilfoil	4.50	\$2,426.05	\$539.12	Habitat/Glyphosate Renovate Max G	0.500 gal/ac 0.500 gal/ac 200 lbs/ac	Reduce problem plants to enhance public access, use and water quality.	>95% control
28 <b>Sesquicentennial</b>	Watershield, milfoil	15.00	\$9,024.00	\$601.60	Renovate Max G	200 lbs/ac	Reduce problem plants to enhance public access, use and water quality.	>95% control
	<b>TOTAL:</b>	<b>77.05</b>	<b>\$39,639.16</b>	<b>\$514.46</b>				
	<b>SCDNR TOTAL</b>	<b>1151.43</b>	<b>\$162,210.12</b>	<b>\$140.88</b>				
	<b>SANTEE COOPER TOTAL</b>	<b>3020.10</b>	<b>\$976,535.41</b>	<b>\$323.35</b>				
	<b>STATE PARKS TOTAL</b>	<b>77.05</b>	<b>\$39,639.16</b>	<b>\$514.46</b>				
	<b>GRAND TOTAL</b>	<b>4248.58</b>	<b>\$1,178,384.69</b>	<b>\$277.36</b>				

**Table 2010-A. Summary of Expenditures by Source for Control Operations During 2010.**

	Water Body Name	Total Cost	Local	State	Federal	Local Sponsor
1	ACE Basin	\$3,989	\$1,995	\$1,994	\$0	SCDNR, USF&W
2	Back River Reservoir	\$45,967	\$22,984	\$22,983	\$0	SCE&G, CPW
3	Black River	\$636	\$318	\$318	\$0	Georgetown Co.
4	Black Mingo Creek	\$445	\$223	\$222	\$0	Georgetown Co.
5	Bonneau Ferry WMA	\$8,939	\$5,739	\$3,200	\$0	SCDNR
6	Caw Caw Park	\$329	\$165	\$164	\$0	Charleston Parks
7	Cooper River	\$15,955	\$7,978	\$7,977	\$0	Berkeley Co.
8	Donnelley	\$10,918	\$4,400	\$6,518	\$0	SCDNR
9	Dungannon WMA	\$1,765	\$0	\$1,765	\$0	SCDNR, USF&W (exp)
10	Durham Canal	\$281	\$141	\$140	\$0	
11	Georgetown Parks	\$4,770	\$2,385	\$2,385	\$0	Georgetown Co.
12	Goose Creek Reservoir	\$31,322	\$15,661	\$15,661	\$0	CPW
13	Horry County	\$18,610	\$0	\$18,610	\$0	SCDNR(IAS)
14	Lake Cunningham	\$2,042	\$1,021	\$1,021	\$0	Greer CPW
15	Lake Greenwood	\$17,541	\$8,771	\$8,770	\$0	Greenwood Co.
16	Lake Moultrie (Carp Only)	\$28,020	\$0	\$28,020	\$0	Note(SCDNR Carp Stocking)
17	Lexington County	\$0	\$0	\$0	\$0	Experimental(No costs)
18	Santee Coastal Reserve	\$43,084	\$21,542	\$21,542	\$0	SCDNR
19	Santee Delta	\$13,725	\$13,725	\$0	\$0	SCDNR
20	US Naval Weapons Sta.	\$7,914	\$0	\$7,914		US Navy
21	Waccamaw River	\$696	\$348	\$348	\$0	Georgetown Co.
22	Yawkey	\$9,198	\$4,599	\$4,599	\$0	SCDNR
	<b>Santee Cooper Lakes</b>					
23	Lake Marion	\$421,997	\$421,997	\$0	\$0	Santee Cooper
24	Lake Moultrie	\$159,297	\$159,297	\$0	\$0	Santee Cooper
	Sub Impoundments	\$19,167	\$19,167	\$0	\$0	Santee Cooper
	<b>State Parks</b>					
25	Barnwell SP	\$2,193	\$1,097	\$1,096	\$0	SCPRT
26	Charlestown Landing SP	\$86	\$43	\$43	\$0	SCPRT
27	Little Pee Dee SP	\$260	\$130	\$130	\$0	SCPRT
28	Sesquicentennial SP	\$2,320	\$1,160	\$1,160	\$0	SCPRT
	<b>SCDNR Total</b>	<b>\$266,146</b>	<b>\$111,995</b>	<b>\$154,151</b>	<b>\$0</b>	
	<b>State Park Lake Total</b>	<b>\$4,859</b>	<b>\$2,430</b>	<b>\$2,429</b>	<b>\$0</b>	
	<b>Santee Cooper Total</b>	<b>\$785,621</b>	<b>\$785,621</b>	<b>\$0</b>	<b>\$0</b>	
	<b>Grand Total</b>	<b>\$1,056,626</b>	<b>\$900,046</b>	<b>\$156,580</b>	<b>\$0</b>	

Table 2010-B Summary of S.C. Aquatic Nuisance Species Control Operations and Expenditures During 2010							
Waterbody	Target Plants	Acre	Total Cost	Control Agent	Rate	Management Objective	Control Effectiveness
1 Ace Basin	Phragmites	10.00	\$1,175.01	Habitat/Glyphosate	0.750 gal/ac-0.750 gal/ac	Reduce phragmites to enhance waterfowl habitat, public access and use.	> 95% control
	Sesbania	41.00	\$2,813.63	Hardball	0.125 gal/ac		
	TOTAL:	51.00	\$3,988.64				
2 Back River Reservoir	Hydrilla	124.94	\$27,530.56	\$220.35 Komeen/Komeen-Reward	16 gal/ac/4 gal/ac-2gal/ac	Reduce problem plants to enhance public access, use, water quality, and maintain electric power generation and minimize impacts to water intakes.	> 95% control Reward/Komeen mix proved to be more effective
	Water hyacinth	252.00	\$16,899.67	\$67.06 Renovate/Reward/Habitat/Glyphosate	0.250 - 0.500 gal/ac		90% control
	Water primrose	20.00	\$1,536.57	\$76.83 Renovate/Habitat/Glyphosate	0.250 - 0.500 gal/ac		90% control
	TOTAL:	396.94	\$45,966.80				
3 Black River	Aligatorweed, Pennywort	10.00	\$636.25	\$63.63 Habitat	0.500 gal/ac	Reduce problem plants to enhance waterfowl habitat.	> 95% control
	TOTAL:	10.00	\$636.25				
4 Black Mingo Creek	Aligatorweed, Pennywort	7.00	\$445.38	\$63.63 Habitat	0.500 gal/ac	Reduce problem plants to enhance waterfowl habitat.	> 95% control
	TOTAL:	7.00	\$445.38				
5 Bonneau Ferry Misc Ponds & Reserves	Water Primrose, Water hyacinth, Frog's bit, Lotus, Cutgrass, Cattails	64.00	\$6,400.00	\$100.00 Habitat/Glyphosate	0.500gal/ac - 0.500gal/ac	Reduce problem plants to enhance waterfowl habitat, public access and use.	>60% control
	Sesbania	37.00	\$2,539.13	Hardball	0.125 gal/ac		>90% control
	TOTAL:	101.00	\$8,939.13				
6 Caw Caw Natural Area	Phragmites	2.50	\$201.10	\$80.44 Habitat	0.750 gal/ac	Reduce phragmites to enhance waterfowl habitat.	>90% control
		1.00	\$127.80	Clearcast	0.375 gal/ac	Reduce problem plants to enhance waterfowl habitat.	>95% control
	TOTAL:	3.50	\$328.90				
7 Cooper River	Hydrilla	36.49	\$11,239.11	\$292.00 Komeen/Nautique/Reward	16 gal/ac/10 gal/ac/4 gal/ac/4 gal/ac	Provide boat trails to main channel through hydrilla. Reduce problem plants to enhance public access and use.	> 95% control
	Water hyacinth	66.00	\$3,531.02	\$53.50 Habitat/Glyphosate	0.250 gal/ac-0.250 gal/ac		> 95% control
	Water primrose	17.00	\$1,186.75	\$69.75 Habitat/Clearcast/Glyphosate	0.250 gal/ac-0.500 gal/ac		> 95% control
	TOTAL:	121.49	\$15,965.88				
8 Donnelley	Frog's bit, Cutgrass, water primrose, Aligatorweed	108.00	\$10,918.00	\$101.09 Habitat/Glyphosate/Galleon	0.500 gal/ac/0.500 gal/ac/0.060 gal/ac	Reduce problem plants to enhance waterfowl habitat, public access and use.	90% control
	TOTAL:	108.00	\$10,918.00				
9 Dungannon	Frog's bit, Cutgrass, water primrose, Aligatorweed	11.00	\$1,765.00	\$160.45 Galleon	0.141 gal/ac	Reduce problem plants to enhance waterfowl habitat, public access and use.	90% control
	TOTAL:	11.00	\$1,765.00				
10 Durham Canal	Water primrose	5.00	\$281.32	\$56.26 Habitat/Glyphosate	0.250 gal/ac-0.500 gal/ac	Reduce problem plants to enhance habitat, public access, water withdrawal, and use.	90% control
	TOTAL:	5.00	\$281.32				
11 Georgetown Parks	Phragmites	39.33	\$4,769.71	\$121.27 Habitat/Clearcast/Glyphosate	0.500 gal/ac - 0.750 gal/ac	Reduce phragmites to enhance waterfowl habitat, public access and use.	90% control
	TOTAL:	39.33	\$4,769.71				
12 Goose Creek Reservoir	Water hyacinth, Water lettuce	122.00	\$8,332.89	\$68.30 Habitat/Clearcast/Reward/Galleon/Glyphosate	0.1875 gal/ac-0.750 gal/ac	Reduce water hyacinth & water lettuce to greatest extent possible.	> 95% control
	Duckweed	36.50	\$9,985.49	\$273.58 Reward/Sonar/Galleon	0.0938 gal/ac - 0.296 gal/ac	Reduce problem plants to enhance public access, use and water quality.	> 95% control
	Water lily	6.00	\$771.00	\$128.50 Clearcast	0.500 gal/ac		90% control
	Water primrose	86.50	\$6,139.76	\$70.98 Habitat	0.5 gal/ac		90% control
	Hydrilla	0.00	\$4,062.90	Triplod Grass Carp	870		> 80% control
	Hydrophila	5.00	\$2,030.00	\$406.00 Clearcast	2 gal/ac		
	TOTAL:	256.00	\$31,322.04	\$122.35			
13 Horry County	Island Applesnails	206.96	\$18,609.79	\$89.92 Copper	up to 5 ppm	Eradicate or reduce problematic snail populations to protect human health and sensitive areas	>60% control
	TOTAL:	206.96	\$18,609.79				
14 Lake Cunningham	Brazilian Elodea	0.00	\$1,008.72	Triplod Grass Carp	216	Reduce problem plants to enhance public access, use and water quality.	90% control
	Lotus, spatterdock	9.00	\$1,033.00	Habitat	0.250 gal/ac		90% control
	TOTAL:	9.00	\$2,041.72				
15 Lake Greenwood	Hydrilla, naiad	0.00	\$17,540.52	Triplod Grass Carp	3756	Reduce problem plants to enhance public access, use and water quality. Eradicate hydrilla from site.	100% control of Hydrilla.
	TOTAL:	0.00	\$17,540.52				
16 Lake Moultrie(Grass Carp)	Hydrilla		\$28,020.00	Triplod Grass Carp	6000	Reduce problem plants to enhance public access, use and water quality.	> 50% control
	TOTAL:	0.00	\$28,020.00				

Waterbody	Target Plants	Acres	Total Cost	Cost/Acre	Control/Agent	Rate	Management Objective	Control Effectiveness
17 Lexington County	Nymphaeodes Peltata	0.50	\$0.00	\$0.00	Clearcast/ Renovate/Galleon	0.500 gal/ac	Reduce problem plants to enhance public access, use and water quality.	> 95% control
18 Santee Coastal Reserve	TOTAL: Phragmites	0.60 366.67	\$0.00 \$43,083.55	\$0.00 \$117.50	Habitat/Glyphosate	0.750 gal/ac/0.750 gal/ac	Reduce phragmites to enhance waterfowl habitat, public access and use.	90% control
19 Santee Delta WMA	TOTAL: Sesbania	366.67 200.00	\$43,083.55 \$13,725.00	\$117.50 \$68.63	Habitat/ Hardball	0.125 gal/ac	Reduce problem plants to enhance waterfowl habitat, public access and use.	95% control
20 US Naval Weapons Station	TOTAL: Phragmites	200.00 75.00	\$13,725.00 \$7,913.75	\$68.63 \$105.52	Habitat/Glyphosate	0.500 gal/ac/0.750 gal/ac	Reduce phragmites to enhance waterfowl habitat, public access and use.	> 95% control
21 Waccamaw River	TOTAL: Water hyacinth	75.00 13.00	\$7,913.75 \$695.51	\$105.52 \$53.50	Habitat/Glyphosate	0.250 gal/ac/0.250 gal/ac	Reduce hyacinth to minimize spread and impacts to public access and use.	95% control
22 Yawkey	TOTAL: Phragmites, cattails	13.00 82.00	\$695.51 \$9,197.51	\$53.50 \$112.16	Habitat/Glyphosate	0.250 gal/ac/0.750 gal/ac	Reduce phragmites and problem plants to enhance waterfowl habitat, public access and use.	> 90% control
	TOTAL:	82.00 2063.39	\$9,197.51 \$286,144.40	\$112.16 \$128.98				
Santee Cooper Lakes								
23 Lake Marion	Crested Floating Heart	1202.0	\$354,272.81	\$294.74	Aquathol K Liquid Clearcast, Touchdown PRO	2.5 - 7.0 gal/ac gal/ac /0.5 gal/ac	Provide access to open water and shoreline areas for public use and prevent spread to other areas of the lake	> 95% in shallow coves with Aquathol K 80% in open water areas with Clearcast / Touchdown PRO Some regrowth noted @ end of season
	Chara	12.8	\$2,531.68	\$197.79	Captain, Cygnet Plus	4.0 - 5.0 gal/ac	Reduce problem plants in residential area where navigation and recreation is adversely affected.	> 95% control of plant at end of season
	Giant Cutgrass, Cattail	8.0	\$799.68	\$99.96	Habitat, Touchdown PRO	0.25 gal/ac 0.50 gal/ac	Reduce plant encroachment on lake-front property and public access areas. Restoration of waterfowl habitat.	100% control of plant at end of season
	Hydrilla	78.0	\$32,327.37	\$414.45	Aquathol K Liquid, Nautique	6.0 - 8.0 gal/ac 1.0 gal/ac	Reduce problem plant population to prevent spread to other areas of the lake. Maintain level until adequate grass carp population from restocking can maintain control	> 90% control of plant after treatment
	Lyngbya, Pithophora	31.3	\$5,670.53	\$181.17	Captain, Cygnet Plus	4.0 - 5.0 gal/ac 0.5 gal/ac	Reduce algal mats to enhance recreational use of water	90% control of plant at end of season
	Water Hyacinth	10.0	\$1,763.91	\$176.39	Reward, Renovate 3, Clearcast	0.5 gal/ac, 0.5 gal/ac, 1.25 gal/ac	Remove non-native, invasive plant population to prevent spread to other areas of the lake	> 95% control of plants after treatment
	Water Primrose, Alligatorweed	85.0	\$18,882.36	\$219.79	Clearcast, Touchdown PRO	5 gal/ac, 25 gal/ac	Reduce shoreline plant populations to enhance recreation and navigation	~75% control of plant at end of season. Some late season regrowth noted.
	Water Willow	11.5	\$1,448.45	\$125.95	Renovate 3	375 gal/ac	Reduce problem plants in residential areas where navigation and recreation is adversely affected.	~85% control of plant at end of season
	Pondweed	9.1	\$4,103.31	\$450.91	Aquathol K, Captain	5.0 - 9.0 gal/ac, 0.95 gal/ac	Reduce problem plants in residential areas where navigation and recreation is adversely affected.	~75% control of plant at end of season
	Water Pod	3.0	\$366.40	\$132.13	Renovate 3	375 gal/ac	Reduce problem plants in residential areas where navigation and recreation is adversely affected	~75% control of plant at end of season
24 Lake Moultrie	TOTAL: American Lotus	1451 2.1	\$421,996.50 \$282.88	\$290.89 \$134.70	Renovate	0.5 - 0.75 gal/ac	Reduce problem plants in residential areas where recreation is adversely affected	> 95% control of plant at end of season
	Cabomba	5.3	\$2,782.29	\$524.96	Sonar Q, Sonar PR	19.5 lbs/ac,	Reduce problem plants in residential areas where recreation is adversely affected	100% control of plant after treatment
	Hydrilla	287.0	\$144,772.80	\$504.43	Aquathol K Liquid, Nautique, Captain	7.5 - 10.0 gal/ac 1.0 gal/ac	Reduce problem plant population to prevent spread to other areas of the lake. Maintain level until adequate grass carp population from restocking can maintain control	90% control of plant after treatment



Waterbody	Target Plants	Acres	Total Cost	Cost/Acre	Control Agent	Rate	Management Objective	Control Effectiveness
	Lyngbya, Pithophora	1.3	\$365.70	\$296.69	Captain, Cygnets Plus	4.0 - 6.0 gal/ac	Reduce algal mats on shoreline and in dead-end coves where navigation and recreation is adversely affected	85% control of plant after treatment
	Water Primrose, Aligatorweed	48.5	\$8,708.82	\$179.56	Clearcast, Touchdown PRO	.5 gal/ac, .25 gal/ac	Reduce problem plants in residential areas where recreation is adversely affected	~75% control of plant at end of season. Some late season regrowth noted.
	Water Willow	0.1	\$25.39	\$253.90	Renovate 3	.375 gal/ac	Reduce problem plants in residential areas where recreation is adversely affected	90% control of plant at end of season
	Pondweed	0.2	\$50.78	\$253.90	Reward, Outrigger Ultra	2.0 gal/ac, 4.0 gal/ac	Reduce problem plants in residential area where recreation is adversely affected.	80% control after treatment
	Parrotfeather	1.0	\$231.86	\$231.86	Renovate 3	1.0 gal/ac	Reduce problem plants in residential area where recreation is adversely affected.	100% control after treatment
	Big Floating Heart	4.0	\$1,121.97	\$280.49	Clearcast, Touchdown PRO	1.0 gal/ac, .5 gal/ac	Reduce plant population to prevent spread to other quiescent areas of the lake	100% control of plant after treatment
	Milfoil	2	\$934.68	\$467.34	Renovate 3	2.0 - 5.0 gal/ac	Reduce problem plants in residential area where recreation is adversely affected.	90% control of plant at end of season
	<b>TOTAL:</b>	<b>562</b>	<b>\$159,297.17</b>	<b>\$453.19</b>				
<b>Taw Caw Impoundment</b>	Hydrilla	171.0	\$19,493.96	\$114.00	Sonar One	4.2 lbs/ac	Reduce plant population to provide public access to shoreline, coves and open water areas and prevent spread of plant to other areas of the lake	>95% control of plant at the end of season
	Water Primrose, Aligatorweed	7.0	\$1,338.81	\$191.26	Clearcast, Touchdown PRO	.5 gal/ac, .25 gal/ac	Reduce problem plant population to provide public and shoreline access	~75% control of plant at end of season. Some late season regrowth noted.
	<b>Total:</b>	<b>178.0</b>	<b>\$20,832.79</b>	<b>\$117.04</b>				
<b>Potato Creek Impoundment</b>	Hydrilla	145.0	\$78,188.41	\$539.23	Sonar Q, PR	7.2 - 4.9 lbs/ac	Reduce plant population to provide public access to shoreline, coves and open water areas and prevent spread of plant to other areas of the lake	>95% control of plant at the end of season
	Lyngbya, Pithophora	40.0	\$4,450.55	\$111.26	Captain, Cygnets Plus	4.0 gal/ac, 1.0 gal/ac	Remove algae to improve access and use of water and improve uptake of furdine into plant	>80% control in areas treated at the end of season
	<b>Total:</b>	<b>185.0</b>	<b>\$82,638.96</b>	<b>\$446.70</b>				
<b>Dean Swamp Impoundment</b>	Hydrilla	116.0	\$66,610.93	\$574.23	Sonar Q, PR	8.3 - 5.7 lbs/ac	Reduce plant population to provide public access to shoreline, coves and open water areas and prevent spread of plant to other areas of the lake	>95% control of plant at the end of season
	Water Primrose, Aligatorweed	12.0	\$2,157.70	\$179.81	Clearcast, Touchdown PRO	.5 gal/ac, .25 gal/ac	Reduce problem plant population to provide public and shoreline access	~85% control of plant at end of season. Some late season regrowth noted.
	Lyngbya, Pithophora	59.0	\$7,523.55	\$127.52	Captain, Cygnets Plus	4.0 gal/ac, 1.0 gal/ac	Remove algae to improve access and use of water for property owners.	~75% control of algal mats at end of season.
	<b>Total:</b>	<b>187.0</b>	<b>\$76,292.18</b>	<b>\$407.98</b>				
<b>Fountain Lake Impoundment</b>	Chara	3	\$608.57	\$202.86	Captain, Cygnets Plus	4.0 gal/ac, 1.0 gal/ac	Remove algae to improve access and use of water for property owners.	>95% control of plant in areas treated at end of season
	Water Primrose, Aligatorweed	4.5	\$1,009.46	\$224.32	Clearcast, Touchdown PRO	.5 gal/ac, .25 gal/ac	Reduce problem plant population to provide public and shoreline access	~75% control of plant at end of season. Some late season regrowth noted.
	Fragrant Water Lily	2	\$339.51	\$169.76	Clearcast, Touchdown PRO	.5 gal/ac, .25 gal/ac	Provide access to open water and shoreline areas for public use	>95% control of plant in areas treated at end of season
	Lyngbya, Pithophora	4	\$856.68	\$214.17	Captain, Cygnets Plus	4.0 gal/ac, 1.0 gal/ac	Remove algae to improve access and use of water for property owners.	Remove algae to improve access and use of water for property owners.
	Pondweed	5	\$1,872.01	\$374.40	Aquathol K Liquid	5 - 6 gal/ac	Eliminate plant population to provide public access to coves and open water areas and prevent spread to other areas of lake	~75% control of plant at end of season. Some late season regrowth noted.
	Water Shield	3.5	\$507.14	\$144.90	Glyphosate	.75 gal/ac	Provide access to open water and shoreline areas for public use	>95% control of plant in areas treated at end of season
	Spargyra	1	\$202.86	\$202.86	Captain, Cygnets Plus	4.0 gal/ac, 1.0 gal/ac	Remove algae to improve access and use of water for property owners.	>95% control of algae in areas treated at end of season
	<b>Total:</b>	<b>23.0</b>	<b>\$5,396.23</b>	<b>\$234.62</b>				
<b>Church Branch Impoundment</b>	Water Primrose, Aligatorweed	6.0	\$870.67	\$145.11	Clearcast, Touchdown PRO	.5 gal/ac, .25 gal/ac	Reduce problem plant population to provide public and shoreline access	~90% control of plant at end of season. Some late season regrowth noted.

Waterbody	TargetPlants	Acres	TotalCust	Cost/Acre	ControlAgent	Rate	ManagementObjective	ControlEffectiveness
	Spargyria, Pithophora	0.3	\$224.11	\$747.03	Captain, Cygnat Plus	4.0 gal/ac, 1.0 gal/ac	Remove algae to improve access and use of water for property owners.	~75% control of plant at end of season. Some late season regrowth noted.
	Pondweed	55.3	\$17,984.30	\$325.21	Reward, Captain	2.0 gal/ac, 5.0 gal/ac	Reduce problem plant population to provide public and shoreline access	~70% control of plant at end of season. Some late season regrowth noted.
	Water Shield	1	\$88.12	\$88.12	Refuge	.75 gal/ac	Remove plants to improve access and use of water for property owners.	>95% control of plant in areas treated at end of season
	Total:	62.6	\$19,167.20	\$306.19				
	<b>Santee Cooper TOTAL:</b>	<b>2437.80</b>	<b>\$785,621.03</b>	<b>\$322.27</b>				
25	<b>SC State Parks</b>							
	<b>Barnwell</b>							
	Water lily, cattails	5.00	\$2,192.50	\$438.50	Habitat/Glyphosate/Renovate Max G	0.750 gal/ac0.750 gal/ac 150 lbs/ac	Reduce problem plants to enhance public access, use and water quality.	>95% control
26	<b>Charlestown Landing</b>							
	Alligatorweed, Pennywort	1.00	\$85.94	\$85.94	Clearcast/Glyphosate	0.250 gal/ac	Reduce problem plants to enhance public access, use and water quality.	95% control
27	<b>Little Pee Dee</b>							
	Spatterdock	6.00	\$260.25	\$43.38	Glyphosate	0.500 gal/ac	Reduce problem plants to enhance public access, use and water quality.	95% control
28	<b>Sesquicentennial</b>							
	Watershield, milfoil	6.00	\$2,320.00	\$386.67	Renovate Max G	200 lbs/ac	Reduce problem plants to enhance public access, use and water quality.	>95% control
	<b>TOTAL:</b>	<b>18.00</b>	<b>\$4,858.69</b>	<b>\$269.93</b>				
	<b>SCDNR TOTAL</b>	<b>2063.39</b>	<b>\$266,144.40</b>	<b>\$128.98</b>				
	<b>SANTÉE COOPER TOTAL</b>	<b>2437.80</b>	<b>\$785,621.03</b>	<b>\$322.27</b>				
	<b>STATE PARKS TOTAL</b>	<b>18.00</b>	<b>\$4,858.69</b>	<b>\$269.93</b>				
	<b>GRAND TOTAL</b>	<b>4519.19</b>	<b>\$1,056,624.12</b>	<b>\$233.81</b>				
		<b>2081.39</b>	<b>\$271,003.09</b>	<b>\$130.20</b>				

## **APPENDIX H**

### **Summary of Public Comments, Responses, and Plan Modifications to the Draft South Carolina Aquatic Plant Management Plan**

**Summary of Public Comments, Responses, and Plan Modifications to the Draft 2013  
South Carolina Aquatic Plant Management Plan**

**Santee Cooper Lakes**

**36 Comments, 3 Opposed, 33 Supported**  
**Internet petition, 206 opposed**

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**Comments**

**Opposed:**

We, the undersigned, support population levels of 10 triploid grass carp per acre of hydrilla as stated in the 2013 DRAFT SOUTH CAROLINA AQUATIC PLANT MANAGEMENT PLAN [hereafter known as 'The Plan'] for the Santee Cooper lakes, Lake Marion and Lake Moultrie. We do not, however, agree with additional stocking of 52,590 triploids to account for the "additional submersed species that are palatable to triploid carp". Triploid Carp are a control method for hydrilla only, and additional fish should not be added under the notion that the fish might consume native, beneficial vegetation. If the fish are consuming native vegetation, other options at controlling hydrilla should be explored. We make these recommendations based on the following:

- Availability of certain aquatic plant species is necessary to provide food and habitat for waterfowl populations wintering on the Santee Cooper System, and
- The Santee Cooper system is a multiuse system and, we believe, the interests of waterfowl and waterfowling are under represented in The Plan, and
- Winter waterfowl populations utilizing the Santee Cooper system are just starting to show a recovery after the over-release of triploids that occurred during the mid-1990s, and
- The Plan lists triploids as control agents only for hydrilla not any other aquatic species, and
- The Plan does not consider the reduction of hydrilla coverage as a result of the very low water levels that dewatered thousands of acres on both lakes in late 2012 through January of 2013.
- Coverage of 5,290 acres of non-hydrilla vegetation is biologically healthy for a shallow-water system of more than 170,000 acres

Clark McCrary +205 others

"Once again I am writing you to ask that you please reduce the amount of sterile grass carp that you plan to release this year."

-Bruce Bonge

"...I do not understand how we need to eradicate the entire "invasive" species of aquatic plants simply because Cross can't draw water out of the lake to cool the 4 units that it has?" "Save the Hydrilla!! The other invasive aquatic species may need some attention in small isolated areas but for the love of the lake don't drop the wrecking ball on the entire ecological system for small isolated areas."

-Marc Scarborough



"After reading the draft plan for Lake Moultrie and Marion, I would request that the panel look at other control methods other than carp. I have been seeing the threat being the crested heart plant more than any other."

-Jess Williams

**Supported:**

"The Santee Cooper Counties Promotion Commission supports DNR's plan to control and eliminate invasive plants in the Santee Cooper lake system."

-Mary Shriner, TMP

"I support the APMP for the treatment of weeds..."

-Frank Bryant

"We support your efforts to control the invasiveweeds"

-Carl M Cagle

"I approve 2013 weed control plan."

-Ann Kelley

"I support Santee Cooper in spraying the invasive weeds in the lakes."

-katandmac tds.net

"My husband and I are 100% supportive of the aquatic nuisance program."

-Christine Edwards

"Please put me on the record as strongly supporting the continuation of the weed control program."

-Ashley N. Cartrette

"I am very much in favor of aggressively treating the aquatic weeds"

-Charles Bostic

"I agree with proposal that Santee Cooper and DNR has laid out to control invasive weeds."

-H.L. "Tap" Tapley

"I am in total agreement with Santee Cooper and DNR's proposal to control invasive weeds"

-Alfred H. Kelley

"I am in total agreement with controlling these weeds!"

-Fay Tapley

"I sincerely hope that Santee will address this situation aggressively this year."

-Patricia R Motley

"I am in favor of DNR's proposed plan for controlling aquatic weeds in Lake Marion."

-Ted Broughton

"I support SCDNR's/Santee Cooper's effort to control invasive weeds in Lake Marion."

-Dianne Munkittrick

"Please, please continue the battle! We need to have someone fighting for us to keep this growth under control. Thank you for all you do!"

-Jeannette Palladino

"I would like to express my support of the 2013 Aquatic Plant Management Plan."

-Debra Gleaton

"Please continue the weed control programs in this area"

-Jami Cornwell

"My husband and I have no problem with Santee Cooper controlling the weeds in the lake"

-Marion Vacher

"I am all for Santee Cooper attempting to re-introduce chemical weed control. I am not sure about the status of the grass carp program, but something has to happen or our lake front property will be a garden."

-Rodney Johnson

"I live on one of the canals, We really need to control the weeds. If not they will completely clog the canal."

-Don Steele

"I am in favor of spraying the lake for weeds."

-Frankie Herndon

"As a homeowner I sincerely hope that this is a program that will continue and not be influenced by occasional users of the waters."

-Sandra & Wayne Smith

"Please allow the folks that know what is best for the lake to continue keep the programs working."

-Danny Winstead

"We really support Santee Cooper's plan to keep these weeds under control."

-Robert and Bliss Adams

"Please do whatever you can to get rid of the rapidly spreading weeds and other invasive plants."

-Tommy Geddings

"Please do not cancel this program or take anything away from it. If anything we need more."

-Don and Karen Marlowe

"Please do not cancel this program or take anything away from it. If anything we need more."

-Mary McSwain

"I realize the lake system is very large, I'm not for total elimination of the vegetation in the lake system, but it does require some type of control either with grass carp, spraying (using something that works) by boat or air."

-Glenn Baxley

"I would like to thank those on your staff who have kept the invasive aquatic, Floating Crested Heart, from taking over Saint Julien's Cove over the past few years. I also appreciate the efforts of your Air Boat Spraying Team who have done an excellent job on their annual visits."

-Ed Davis

"I appreciate you in advance for letting me express my opinion of the spraying of the lake and keeping our water clear of the aquatic weeds."

-George Morris

"Please help us to clear our water of this nuisance so that people & wildlife can return to normal"

-Peggy Ramsey

"Just a note to add to the others in support of your efforts to control the invasive weeds. We Agree!"

-Joe Newman

"I encourage you to dedicate more time and resources to this and other endeavors to protect our lakes."

-Pamela D. Anderson

### **Comments and Revisions:**

#### **Response:**

SCDNR and Santee Cooper continue to agree that we need aquatic vegetation in the Santee Cooper Lakes to have a great natural resource. We also agree that vegetation absolutely needs to be of the native variety and not hydrilla. Eradication of established hydrilla utilizing current technology is virtually impossible. The goal of aquatic plant management on the Santee Cooper Lakes is to reduce hydrilla acreage while promoting a diverse natural habitat for fisheries, waterfowl and other animals. That goal is set forth in a Memorandum of Understanding between Santee Cooper and the SCDNR. The MOU provides for a minimum of 10% of the surface area of the lakes to be maintained with a diverse assemblage of native aquatic plants which includes a combination of submersed, floating leaf, and emergent plant species that provide habitat and food for game and non-game fish and wildlife species. According to a survey in the fall/winter, 22% of the Santee Cooper system has aquatic vegetation with over 9% of that being submersed native vegetation. These totals are well above the 10% minimum with almost that amount of native submersed vegetation alone.

The hydrilla increase is what is so problematic. Not only has the hydrilla acreage doubled to just over 7210 acres on the main lake system, It is actually replacing some of the native eel grass (Vallisneria) in some coves in lower Marion and upper Moultrie.

The consensus of those that disapprove of the plan seems to be in favor somewhat of controlling the invasive weed hydrilla while allowing native species to flourish. Generally the most unified approach by some of the commentators is to allow the 25 fish per vegetated acre for 7,210 acres( to move forward with disapproval towards the extra fish directed towards the additional stocking rate of 10 fish per vegetated acre of native pondweeds and naiads. The opinion is the stocking of this extra amount will definitely be detrimental to the ever increasing population of beneficial native vegetation. While those opinions contain merit it does not take into account the SCDNR and Santee Cooper's intent to monitor the progress of the carp's control and the potential negative impacts to native vegetation. The plan is not trying to eliminate the naiad or pond weed, but trying to account for the distraction it creates to hydrilla herbivory. Research is still underway by SCDNR fisheries staff to determine the most effective ways to reduce the grass carp population if they are effective on the hydrilla but have too great a negative impact on beneficial native species. This is a concerted effort to shift from a maintenance issue to a more aggressive approach to re-balance the system to reduce hydrilla while still promoting growth of native beneficial vegetation.

In order to enhance native plant growth and habitat, innovative management techniques shall continue to be utilized. Introduction of desirable native plant species, which enhancing wildlife and waterfowl management areas and implementing strategic lake level management measures will be continued in 2013. Those efforts include Santee Cooper and SCDNR staff; along with numerous concerned volunteers spending numerous hours on the lakes in an effort to harvest seed for additional plantings in the spring and summer. Techniques are have been developed for more efficient and effective planting techniques

Also included in the MOU is annual monitoring of the vegetative community and a cooperative effort to monitor the health of the fishery and waterfowl populations. The data derived from annual surveys will be utilized in an annual meeting between SCDNR and Santee Cooper to review the results of monitoring and treatment programs and to determine the effectiveness of the programs and to develop annual work plans.

Sterile grass carp are utilized so that we may control their numbers in the lakes and eliminate an overabundance. Current research shows that the carp have an approximate mortality rate of 32% per year. Grass carp have been in the system throughout the entire recent period of vegetation expansion. Some \$400,000 was expended to determine the impacts of stocking grass carp in the Santee Cooper lakes, including impacts to fisheries, water quality, and vegetative coverage. Additionally, the U.S. Army Corps of Engineers developed and published a detailed Environmental Assessment for the use of grass carp to control hydrilla in South Carolina in both the late 1980's and again in 2005. The EA considered impacts to native fish populations, water quality, aquatic plant populations, as well as tourism and recreation (fishing, hunting and boating). Among other positive findings, the EA states that "sterile grass carp provide a safe, cost effective means of controlling nuisance aquatic vegetation in South Carolina. Once again, DNR and Santee Cooper are committed to protecting and enhancing the native vegetation community. We plan to continue to monitor their status and take corrective action if unnecessary impacts occur.

**Plan Modifications:**

None at present time.

**Summary of Public Comments, Responses, and Plan Modifications to the Draft 2012  
South Carolina Aquatic Plant Management Plan  
Santee Cooper Lakes**

143 email comments, 51 opposed, 92 supported  
Internet petition, 241 opposed

**Comments:**

**Opposed:**

**Internet petition:**

We, the undersigned, support population levels of 25 triploid grass carp per acre of hydrilla as stated in the 2013 DRAFT SOUTH CAROLINA AQUATIC PLANT MANAGEMENT PLAN [hereafter known as 'The Plan'] for the Santee Cooper lakes, Lake Marion and Lake Moultrie. We do not, however, agree with additional stocking of 47,900 triploids to account for the "additional submersed species that are palatable to triploid carp". Allowing for existing populations of 20,400 fish, we only support the release of an additional 60,700 triploid grass carp during calendar year 2013. We make these recommendations based on the following: • Availability of certain aquatic plant species is necessary to provide food and habitat for waterfowl populations wintering on the Santee Cooper System, and • The Santee Cooper system is a multiuse system and, we believe, the interests of waterfowl and waterfowling are under represented in The Plan, and • Winter waterfowl populations utilizing the Santee Cooper system are just starting to show a recovery after the over-release of triploids that occurred during the mid-1990s, and • The Plan lists triploids as control agents only for hydrilla not any other aquatic species, and • The Plan does not consider the reduction of hydrilla coverage as a result of the very low water levels that dewatered thousands of acres on both lakes in late 2011, and • Coverage of 4,790 acres of non-hydrilla vegetation is biologically healthy for a shallow-water system of more than 170,000 acres.

Troy Smart, Lesa Thomas, Mathew Parrott, Curtis S. Dewey, Jamie White, Josh Britt, Dwayne Padgett, Thomas Michael Siwarski Jr., Scott Mcwatty, Paul Taylor, Nick Riley, Brandon Stockman, James Boyd, Christopher Price, Phillip Felkel, Bradley Poston, Ralph Cante Jr, Zack Thomas, Chris Ard, Drew Fasano, John Ball, Kyle Kirkland, Stuart Kemp Watson, Brigham Watson, Kevin Lusk, Cory Belue, Ralph W. Archer III, Anthony Wade, Jason Lynch, Wes Drummond, Nickles Mirmow, Kevin Gause, Trent Smith, Clark Fons, Christopher Eddy, Murray Padgett, Randy Kinard, Justin Howe, Henry M Hickman, RAY Smith, Jonathan Smith, Greg Mccaskill, Russell Boykin, Will Macinnis, Robbie Nalley, Connor Stone, Keith Campbell, Rusty Bair, Wilson Smith, Michael Austin, Logan Bryan, Andrew Taylor, Jay Orders, Jimmy Lee, Kerry Brewer, Chris Ashley, R. Chilton Stone, Johnny Drew III, Aaron Clossman, Glenn Hearn, Margaret S. Stone, Elliott Mimms, Miles Altman, John F Bryan Jr, Jay, James Vaughan, Sam Tiller, Jimmy Bradham, John Snowden, Greg Hendrick, Megan Kelley, Chris Hewette, Leif Busby, Belinda C. Hrivnak, Bruce G. Strong, Jess Williams, Jonathan Gowdy, Joel Barfield, James Fitzgerald, James M Bradham, William Condon, Billy Ray Goff Jr., David Mccracken, Will Ligon, Jonathan Cameron, Blakely Byrd, Jacob Beach, Mike Joyner, Parker Coulliette, Carl Broadway, Jonathan Dangerfield, Darren Troy Cranford, Rodney L. Scruggs, Michael Watson, Tyler Pearson, Justin Crafton, Angela Livingston, Ben Livingston, Joshua Pifer, R Patten Watson, Brandon, Bryan Frazier, Cleve Hancock, Jeff Mcdaniel, Thomas Madray, Caldwell, Marc Sanders, Anthony Hawkins, John Benjamin Thompson, Greg Allen, Ryan Coyle, Jesse Sheehan, Daniel Sanders, Zachary L. Taylor, Sara Nicole Thompson, Andrew Magee, Francis D Newman Jr, Samuel Thompson, Reed Watts, Samuel C. Thompson, Chris Hickman, Lesa Spencer Mosier, Tammye J. Tidwell, Weston Simmons, Scott Frye, Parker Miller, David T Hill, William Russell, Michael Coulter, Melanie, Brandon

R Wiles, David Ferrell, Cathy Danigel, Adam Murray, Ronald Kyzer, Tonya Morris, Lori Morris, Sophia Morris, Badge Baker, Matthew Mcalister Prendergast, Keith Krell, Dan Smith, Patrick Brailsford, Mark Reich, Michael Rodgers, N. Ivey, J. Hugh Campbell, Matthew Beecher, Marvin Morgan, Jeremy Wills, Mark Price, Chris Carter, Brian Hatch, Kyle Huggins, Douglas Sass, Kevin Van De Steene, Heather C, Fleetwood Hassell, Alexander D Stone, Will Eaddy, Douglas H. Sass Sr., William Southerland, Phillip Lowe, Ryan Reynolds, Richard Pratt, Chris Hooker, Brad Hollon, Blake Johnson, Jon Collins, Cody Harper, Dillard Salmons, Matthew Nichols, Richard Knight Jr, Drew Charles, Jeff Fralick Jr., Jason Giovannone, Christopher Bradham, Sarah Bradham, Rhett Riddle, Brandon Wagner, Chauncey Finch, Ty Bodiford, Andrew, Tee Rowland, John Fuss, Sanders A. Franklin, Greg Zett, James F. Seabrook, Chris Brewer, Hunter Goodson, Cory Hawkins, Adam Shumpert, Phillip Howard, Kevin Lee, William Mclaurin, William, Justin Stroud, Amanda Stroud, Tracy Huggins, Trey Bryan, Joe Stroud, Harleston Towles, Mark Heinzelman, Bren Stone, Robby Elliott, Justin Robinson, Jeff Spires, Kyle Snelgrove, Jae Higgins, Phillip Rizzitello, Michael Weekley, Brandon, R. Broward, Bill Towles, K. A Mattox, Marcus B Sizemore, Hunter Neeley, Charles Kupfer, Rick Mclean, Eryc Riddle, Chris Mccorkle, Mark Montrose, Jack Wolfe, Brandon Steen, Brian E Gainey, Clint Morrison, Chris White, Jon Greider, Benjamin M. Sanders, Ben Kuhn, Kerry Fritz, Mike Crapps, Billy McIntosh, Inky Davis, James Kirby, Matt Mays, Jonathan Redding, Mark Williams, Tyler Kirby, Michael Blankenship, Cristal Thompson,

I oppose killing all grass. They are about to put 100000 more grass carp in lake when lake is just recovering from last massacre  
Harold R. Waynick, Jr.

The lack of grass has tremendously had an impact on duck hunting and bass fishing. Can we just leave the grass alone? It only seems to maintain migrating waterfowl and protect cover for our bass! I strongly feel the release of grass depleting carp is a terrible idea!!  
Thanks,  
Kevin Roberson.

I strongly oppose the idea of putting more grass carp in the lake to kill the invasive weeds. The lake is finally getting back to being a good fishery and I feel that this would set it back tremendously.  
Ken Rosefield

We understand control but 100k grass carp and spraying all of it is too much.  
We want some grass!!!  
clay lowder

I , as a avid sc outdoor enthusiast ,wish to oppose the placing the 10,000 grass carp in our lakes.  
Scott kinder

I think we have done enough to ruin the lakeside economy. I gave been fishing my whole life (35 now).  
Brent Waynick

Many more shorebirds and waterfowl along with a resurgence of bass and panfish. I think we can all agree that the aquatic vegetation growth has played a big role in this new life. I understand the need to manage weed growth but a large population of grass carp cannot be controlled and could possibly return the lake to its barren state of a few years ago

Bilton, Jeff D

Back in the 90's we had a thriving lake system bringing in Millions of dollars to all the local towns and businesses. Keeping the grass out the turbines could not possibly cost more than destroying the economy for thousands of people. I would like to know exactly why the grass is such a problem? All I know for sure is when the lakes were full of grass we never had a lack of electricity nor did we have a price increase due to grass in the lake. I think placing grass carp in the lake is the solution for being lazy and just some people not wanting to deal with it.

Edward L Cox III

As an avid outdoorsman and wildlife enthusiast, I strongly urge you to reconsider increasing the number of triploid grass carp to 108k fish. The Santee Cooper lakes have witnessed over a decade of hardship and are just beginning to see light at the end of the tunnel.

I am well aware of the need to control hydrilla, and other invasive plants, and I am aware of the detrimental effects of grass carp. 108k fish to control 3k acres is well above protocol. Stocking additional fish on the idea that some fish may eat native vegetation over hydrilla is bad science. Please reassess the 2 decade old study that concludes the 32% mortality rate of carp. Certainly this number is high.

Clark McCrary

Not only will it inhibit various waterfowl habitats, but it will also destroy natural ecosystems and feeding habits of many animals.

Additionally, there will be a substantial impact on fishing. The amount of money generated on these lakes and rivers from outdoor and sportsman activities would be even more devastating than it already has been past.

Jeff Bowers

I am against the stocking of additional grass carp in the Santee Cooper lakes. This is too costly for the SCDNR to fund and it will hurt non-target plant species.

Please consider a more concentrated approach on problem and sensitive areas. Don't ruin the rest of the lake.

Sarah Peake

I believe that introducing this large number of fish in addition to chemical controls will harm the non-target plant species in a greater capacity than the plan suggests.

Please reconsider this plan. Our lake system has seen a resurgence of fish quality AND fish populations that hasn't been seen in decades

Chris Bradham

I appreciate the efforts of DNR and Santee Cooper to make the lake system an area that is able to be enjoyed by thousands of sportsmans and the local businesses of the area, but I do question your stance on invasive weeds. But why cant the unwanted areas of the weeds be managed on a more micro level rather than methods such as carp stocking that will destroy the weeds on the entire lake including areas that there presence is vital.

Preston Kight



I would love to see this done away with. The aquatic vegetation in the states lakes (especially Marion and Moultrie) is very important to wintering waterfowl and provides excellent habitat for a number of fish species

Freddy Taylor

I am for a more balanced approach to managing the aquatic vegetation in the Santee Cooper lakes. In recent years we have seen a slight increase in the coverage of vegetation which has improved the habitat for fish and wildlife. However, the coverage of this vegetation does not meet the minimum of ten percent coverage of the lakes. We need to encourage growth on areas of the lakes that are less populated so that the wildlife and fish can flourish once again. By adding more triploid carp, we will only reverse what improvements we have seen over the last few years. There needs to be a sound management plan that will provide a balanced benefit to both wildlife enthusiasts and pleasure boaters.

Davis Lee

Application timing of the chemical controls should consider professional fishing tournaments held on the lake. Spraying during a tournament, especially spraying the participants by helicopter, has already made an impact on the decision making of some professionals on whether or not to participate in the tournaments.

Greg Williams

I am not in favor of the releasing of additional grass carp into the Santee lakes. Grass carp not only consume invasive vegetation, but also native vegetation. The stocking of grass carp has too much collateral damage to other vegetation which degrades the hunting and fishing opportunities in this state. I also feel an effort should be made to disturbed native vegetation in other portions of the lakes.

Wagner, Brandon

I have seen both lakes rebound from near disaster of over stocking these fish in the nineties and would hate to see this trend reversed. Please note that as a voter and tax paying citizen that I would love the money that would be used toward restocking to be used for better equipment our DNR officers to better enforce the laws in force at this time

**Thomas A. "Bubba" Johnston III**

Please consider sportsman in your 2013 APMC plan. For years, the sportsman has been ignored due to the interest of homeowners and recreational boaters. Aquatic vegetation provides valuable cover for fisheries, and food sources for migrating waterfowl. In the past twenty years, duck hunters have seen the numbers of migrating waterfowl decrease on the Santee Lakes by thousands and thousands to the point where there are almost no ducks on the lakes. This is due to the fact that SCE&G has killed almost all the plant life in the Santee Lakes. It is an embarrassment to squander such a natural resource, and we should all be ashamed for allowing agencies to trash a resource which was once so plentiful.

Wilson Smith

Personally, I do not think that the cost to run this project will be a wise expense for our state's Department of Natural Resources. As a citizen who donates money to the SCDNR through license purchases, taxes AND voluntary donations I oppose this action and hope that the SCDNR will understand that the recreational aspect of these lakes is just as important as any other.

Charles Stuart

With the current state of waterfowl, shore birds, and fish showing an increase directly proportional to the expansion of the vegetation. The 10% rule of acreage that should be maintained by Santee Cooper is not being met.

D. Gene Gabrielli II

I am a duck hunter and a lifelong resident of the low country and I am disappointed that the managing scientists like yourself find it necessary to raise the triploid grass carp population to 250% of what it currently is. It is my understanding that this is being done to offset the fact that the grass carp are not feeding solely on hydrilla, but rather on our native vegetation and grasses as well. The logic that triploid grass carp may be feeding on other native grasses is absurd. Research has shown that grass carp will feed preferentially on hydrilla before feeding on our native grass species. By increasing the population you will, in essence, force the grass carp population to feed even more on our native grasses once they have eaten all the hydrilla in an area, which a population that size will not certainly do.

Will Klauber

I am writing this email to let you know of my concern of these fish wiping out all native vegetation on our lakes. I agree that the hydrilla is a grass that spreads rapidly and needs to be controlled but I also understand that with the introduction of more carp that they will consume the hydrilla and every other vegetation in the lake

Richard Pratt

Hydrilla, as well as Southern Naiad, among others, has continued to increase on the lakes exponentially. As we know, these SAVs are a beneficial and crucial part of the native fish and migratory birds that come through our area every year. I, along with many others, believe that hydrilla and other native SAVs should be allowed to return to benefit our struggling fish and waterfowl industries. Another concern of mine is where is all this money going to come from? Is there any wonder that the good game wardens of Santee Cooper can't even afford to check people on the lakes? -

Warren Boyd

South Carolina needs grass in our lakes to bring fisherman from other states here to spend money in our state. The eradication of hydrilla has ruined Lake Murray, and from the way it looks on paper, Santee Cooper lakes are about to be ruined again just like in the 90's

kpridgen

If you all go thru with this you'll will destroy the ducks habitat and force them to relocate. It is already so hard to hunt because of residents and expansion of neighborhoods and clearing the ducks homes. I hate to say this but if you guys go thru with this it will drop the ducks population and you would have a lot of angry hunters. I support the DNR, but I don't like this move.

josh Whitmore

It is completely detrimental to the now small duck population.

Eric Stone

Over the past few years, aquatic vegetation has been allowed to flourish in the lakes system and the rewards have been great for the citizens of South Carolina. The numbers of both waterfowl and other types of birds using the lakes have improved providing better hunting and bird watching opportunities. The fishing has also begun to return as fish find more food and habitat in the SAV's. Please, for the health of our lakes, reconsider the plan to stock 108,600 carp for a much smaller number that will allow SAV's to flourish (at least in some areas).

Doug Sass

These efforts are not working and are costing not only heavy dollars, but this is done at the expense of the lakes aquatic life and towns that the lakes tourism once supported.

John Fuss

It seems to me that more emphasize should be put on Game Warden hiring and pay, and the maintenance of all the state ramps and facilities.

Allen Mclean

As a frequent boater, fisherman, and hunter on the lakes, I do understand the need for balance when it comes to aquatic vegetation. My feeling is that the additional carp, while controlling some of the hydrilla, will greatly impact the native submergent vegetation we all would like to see in the lakes for habitat and food sources. There just isn't enough real evidence to say they prefer hydrilla, you even mention the need for additional carp do to the fact some will feed on naiad.

Mechanical means to supplement a smaller number of carp will best serve this purpose as well as protect the native submergents we all want to see back in the lakes.

Ben Kuhn

Increasing the number of Grass Carp in the lake is ridiculous, if anything the ones that are already present need to be gotten rid of.

Hunter Felkel

I started duck hunting in the late 80's it was so so, but then in the 90's we got hydrilla! Waterfowling took off. It was great! The bass fishing was extraordinary. Set records for heaviest 5 bass limits. Because of the hydrilla!! Early 2000's no more grass. Duck hunting and fishing got real bad. Because of all the hydrilla being eaten by the carp. Now we have some grass again. The duck hunting and fishing is getting better, not quite like the 90's but getting there.

Brian Martin

A little common sense with weed control could go a long way. Fishermen that come from all over the U.S. expect great things when they come to Santee. Grass in the lakes provides shelter for bait fish and habitat for the game fish - it grows fish. Although home owners may not want any grass at their front door, it may be best to allow grass to grow in other areas of the lake for fish habitat. Grass control may provide the best of both worlds and make everyone happy.

Denny Eaddy

I am opposed to the spraying of grass and release of carp in the Santee Cooper lakes. It has affected the lakes for the habitat of waterfowl and also the decline of fishing. It affects bait fish as well. I have not seen "fresh water shrimp" in the lakes since the spraying was introduced. It has affected the ecosystem drastically. DNR and Santee Cooper need to help put back in the lake systems and reintroduce natural vegetation so it can thrive again as once was.

Ryan Reynolds

I am sure that there is a happy medium between all parties involved in the debate on hydrilla in the Santee lakes. It is very obvious that the number of ducks wintered on our lakes has dramatically declined since the hydrilla has been removed. It has also changed the way we fish the lakes. We have all of the resources, I just hope we can put them to use in a way that would benefit everyone.  
Chris Price

Please protect the natural resources we have in this beautiful state we all call home. The grass populations on our local lakes support precious ecosystems that need protecting from carp that destroy them. Recreation is no reason to destroy native populations.  
Justin H.

Uncontrolled expansion of hydrilla as we experienced in the past is not a good thing for the lakes, the users, or the homeowners, neither is the eradication which we have also experienced. Control is the key. Of the hydrilla AND the grass carp. The carp will continue to eat and eat and eat and eat until we have a veritable desert under our waters once again. Our lake systems have been decimated twice in the last 2 decades. One was the drought- over which we have no control. The other was the crash of the world class fishing and duck hunting which was man made due to overstocking of grass carp.  
Mark Williams

Please consider the negative effect that this plan of releasing more carp into our lakes will have on native species of fish and migratory birds. \$900K is too much to spend on a project that will deplete our natural resources. Please do not cater to out of state retiree's and do what is in the best interest of those of us who are native South Carolinians that grew up with healthy ecosystems.  
Drew Postal

I think that the introduction of more carp that will consume native natural vegetation would be a bad idea. Yes, it is a good idea to control the invasive hydrilla, but you can not make those carp eat only hydrilla they will eat everything in their path.  
Peyton Stilp

Data shows that Santee-Cooper's goal of keeping a minimum of 10% of the two lakes' total surface acreage covered in vegetation is not being reached. I would like to see that goal met, or even exceeded soon. I understand White Amur consume native vegetation as well as hydrilla, and are therefore not the most efficient method of vegetation control or funding use. Especially when equal damage is done to native plant species that are immensely productive for said wildlife.  
Miles A. Altman

I surely hope you folks will not take any steps to diminish the amount of aquatic plants in Lake Marion and Moultrie! These plants are a vital part of such a wonderful ecosystem. They offer food & cover for fish & birds. Please leave the grass alone!  
Rob Jackson

I support a balanced approach for home owners and sportsmen alike. Since the napalm approach to the Hydrilla problem, and the resulting fallout to native vegetation the lakes are a far cry from what they were. Now, I see more cormorants than ducks, and DNR is forced to stock the lake with Striped

Bass to maintain any fishable population. Triploid carp, striped bass, and herbicides are costly. Maintaining a resource for the benefit to all, will pay dividends. As I understand the report, I see that the carp released last year was included in the total numbers, however, those who compile the report did not include that they are not yet at a size where they will do any "good". I urge you to please consider what will happen when all the carp that are released. They will reach a size that hydrilla will not sustain their appetites, and they will move to native aquatic vegetation.

Justin Stroud

I oppose the additional stocking of grass carp for management of vegetation. Fishing could be a money generator for this area if the lake returned to it's natural condition.

Mark G. Hopson

Please **do not** restock the lake with grass carp. Santee Cooper was the favorite lake for many years of the pro fishing circuits that generated vast sums of money for the economy. However, since the stocking of grass carp and the eradication of the vegetation that made the lake so great, the pros no longer want to come to this lake.

Richard W. Smith

Over the years I have noticed a decline in the Santee Cooper Lakes starting with the attempts to control vegetation with Carp and Chemicals. I beleive the effort to control hydrilla is slowly killing a great fishery. Fish species that require cover are slowly dying out. During the last 3 years, with the cessation of chemical spraying and the grass carp starting to die out, I have noticed a rebound in the fish species I fish for. This will amount to the destruction of what small amount of habitat is left. I feel we should have a healthy amount of vegetation in the lakes to provide breeding and cover habitat for fish and bird species. The past war on hydrilla in the lakes proves that to try an eradicate it is useless effort. I feel that all aquatic vegetation should be allowed to flourish as long as it doesnt effect the hydroelectric power facilities.

Bruce Baker

We have started to recover from one of the largest Natural Resource Management gaffes of the 20th Century on Santee Cooper when we released several hundred thousand grass carp 10-15 years ago and ended up with an underwater "desert", void of vegetation, including native. There is no "recall" once the grass carp are put in there, and their preference for Southern naiad's and other native vegetation, *presumably* after they eat non natives is concerning. Please consider using other methods, including mechanical and chemical to specifically target the weeds you are after.

Jesse N. Williams III

I understand that there has been a rapid increase in hydrilla coverage on Lake Marion and Moultrie at an alarming rate of 300%. Unfortunately I am adamantly opposed to the grass carp stocking rate proposal by Santee Cooper.

I have personally witnessed the beautiful vast Valsineria beds that have established on the lower area of Lake Marion. The rapid increase in NATIVE submergent aquatic vegetation is what is so vital to the health of South Carolina bodies of water, especially Lake Marion and Moultrie. I would like to know if all herbicide application techniques have been exhausted? I would also like to know a 12 month seasonal timeline for herbicide application rates by Santee Cooper and question why there seems to be a heavy application in the Fall just prior to a natural winter dieoff of submergent aquatic vegetation **as well as the arrival of migrating waterfowl who utilize this vegetation!**

Paul Taylor

Our lakes system is inching toward improvement when it comes to native SAV's for our fish and waterfowl to benefit from, and I am not referring to Hydrilla. Santee Cooper is supposed to maintain at least 10% coverage of vegetation, and our lake systems are not even at that number.

Dr. Alex Brammer

I write to you today as someone who has seen Lakes Marion and Moultrie when they were completely overgrown with hydrilla, through the years when herbicides were used in an attempt to control it, when the grass carp were stocked resulting in the creation of a lake bottom that resembled a desert, and now when the lakes are finally recovering from this desertification. Instead of increasing control in small increments until a balance agreeable to all users is reached, Santee Cooper and the SCDNR are going to flood the lake with a fish species that in itself is invasive in order to control another invasive organism. In doing so, ridding or nearly ridding the lake of hydrilla I'm sure will be achieved. Please use a gradual increase in control methods until the desired result is reached instead of over doing it this year and sending the lakes back to desert status.

B.K. Bonge Jr.

I've read the draft AM plan. I've seen the Santee Cooper system slowing coming back to life from the overstocking of grass carp in the mid and late 1990's. Please do not make that mistake again. Also, the effect of the reduction of hydrilla coverage resulting from the September spraying and the extremely low lake levels in late 2011 should be taken into account before considering anything as long-term as an increase in the number of grass carp.

Grass carp can always be released, but it's impossible to un-release them. Please do not do release any additional triplods without first assessing the actual hydrilla situation 2013.

Stephen Thomas,

**Approve:**

The Santee National Wildlife Refuge (NWR) would like to express support for the 2013 South Carolina Aquatic Plant Management Plan developed by the SC Aquatic Plant Management Council and SCDNR. The plan is consistent with U. S. Fish and Wildlife Service (Service) policy on control and removal of exotic invasive organisms that have harmful impacts on aquatic natural resources and on the human use of these resources. Additionally, the plan is consistent with the Santee NWR Comprehensive Conservation Plan goals and objectives. The occurrence and spread of exotic, invasive, and nuisance plant and animal species has been identified by Service staff and intergovernmental partners as one of the priority management issues facing Santee NWR. We support approval of the 2013 SC Aquatic Plant Management Plan to enhance the biological integrity, desirable native vegetation, compatible public uses and control of undesirable, aquatic invasive species on the refuge and contiguous ecosystems.

Marc Epstein

Wildlife Refuge Manager

The Santee Cooper Lakes continue to be a valuable asset to our county and its businesses. Throughout the years many people have come to our lakes for all types of outdoor recreation. This tourism has brought much needed revenue to our local economy and has helped support our community. In recent years the health of our lakes has been questioned, but now this activity is starting to pick back up and our lakes are improving. This is evidenced by an increase in the lakes

grasses that provide good habitat for all types of animals. This habitat is helping us attract the professional tournaments back to our area and is helping to start some economic activity. We do not want to see our lakes return to the condition that they were in and do not want this forward progress to be killed. Santee Cooper has been a good steward of our natural resources and a good neighbor for their surrounding communities. We do understand the problems with nuisance aquatic vegetation, but feel that our local economies depend on a healthy lake with good habitat to support a diverse wildlife population including all types of fish, waterfowl, and other birds. This wildlife population made our lakes into the great tourist attraction that they once were and we would like to see our lakes continue that tradition. The Clarendon County Chamber understands that there are many uses for our lakes, not just wildlife, and know that Santee Cooper can find a good balance for all who enjoy our lakes. Thank you for taking the time to hear our input on this subject.

Dawn Griffith, Executive Director  
Clarendon County Chamber of Commerce

This commission is committed to supporting all efforts that prevent this from ever happening again.  
(Shriner, M. Santee Cooper Country)

We would like to see the weeds on Lake Marion, Wyboo area controled as our children, grandchildren and ourselves enjoy swimming, boating, and skiing.  
Samuel E. and Ann Plowden

The weeds are ruining the quality of the lake for recreational purposes. Since the lake is also a big tourist sell for fishing and recreation, we would think DNR would be committed to controlling weeds and any other problem that would be detrimental to the beauty and usefulness of the lake.  
Sincerely,  
LeRoy and Mary Lou Carter

We are fully in favor of the 2013 aquatic plant management plan. We appreciate all the hard work that goes into it.  
Thank you,  
Hugh & Jennifer Miller

We are in favor of DNR's Aquatic Plant Management Plan. These weeds are most harmful to recreation and most fishing on Lake Marion.  
Bobby and Judy Campbell

It is imperative that DNR and the Council continue with an aggressive and innovative stance to control invasive plants and weeds in our lakes in South Carolina...Once a problem is out of control, the cost to deal with it is much greater than if it is dealt with on a routine basis...I strongly urge DNR and the Council to take a strong stance towards continued funding and possible increased budget and not make the future costly mistake of allowing problems to become severe before dealing with them.  
Julie Rickenbaker

We have a place at Santee and support the Aquatic Weed Control Plan.  
Lide Winburn

In 2010 we had the onset of a major weed and invasive plant problem that would have taken over Church Branch. That did not occur due to the outstanding actions in 2011, of Chip Davis and his crew from Analytical and Biological Services of Santee Cooper in Moncks Corner. I strongly urge DNR and the Council to take a strong stance towards continued funding and possible increased budget and not make the future costly mistake that Florida did.

Dwight L. Foster

I definitely support any and all attempts to control the invasive weeds in Lake Marion and Moultrie.

Bob Drastura

This is an written notice from Bobby J. Tillman @ 1197 Haynesworth Mill Circle, Summerton, SC, requesting in favor of proper weed control around lake area (Santee Cooper).

Bobby J. Tillman

I believe the Aquatic Plant Management Division is doing an excellent job of balancing the needs of both fishermen and recreational users.

Hal White

I am very much in support of the efforts to control the invasive weeds and grass in the Wyboo area of Lake Marion. Please make every effort to continue the program. The Potato Creek neck is almost covered and a similar situation in the Wyboo would destroy recreational opportunities. Thanks again to SCDNR and SANTEE COOPER for the work they have done.

Joe Davis

Aside from reduced recreational opportunities, this is an economic issue for those of us who purchased "lakefront property" at a premium, and who are annually confronted with both Santee Cooper drawdowns and aquatic nuisance species hindering both enjoyment and resale values. I know that resources are spread very thin, but hope adjustments will be made, if necessary, to insure the White Oak II area will be treated effectively this season.

Robert P. Sullivan

As a home owner on Lake Marion, I am in favor of spraying the weeds that grow in the water around my dock and beach area. These weeds create a real problem with jet skis. They also create a mud bed over the natural sand that is there. I feel there is plenty of grassy areas around the lake for fishing and would like to see the weed control spraying continued.

Robert A. Armstrong

Brenda M. Armstrong

I am a homeowner on the lake and I whole heartedly support the use of insecticides(aquatic safe of course) to rid our lake of the growth that threatens our habitat. The program should be stepped up.

Paul Moore

Thoroughly agree with the control of invasive species.

Particularly interested in control of Lake Marion in Clarendon county.

Michael A. Lane P.E.



Please accept this a request from our family to not only continue but also strengthen your efforts to combat the invasive weeds that have contaminated Lake Marion...The weeds that appeared in late summer 2011 robbed the lake of much of its recreational value. Thank you for all that you do to maintain this priceless asset, and combat these weeds that have the potential to completely destroy much of the value of the lake.

William and Wanda Johnson

Please include spraying for the control of hydrilla and other invasive water plants in Lake Marion and other lakes in the state as part of the overall Aquatic Plant Management Plan strategies.

Martha Jones

I highly recommend the removal of any non-native plants in our state of SC.

Paul Lowrance

The Mill Creek area and most other creeks off Lake Marion are being overtaken by both Floating Crested Heart and Lyngbia. Santee Cooper treated areas for the Floating Heart in 2011, but it had little or no effect on the plants. I fear they will be worse this year. I also noted that you did not list Lyngbia in your plan. It is a blackish-green algae that is covering the bottom of the lake's creeks. I sincerely hope, DNR will work until these two invasive plants are destroyed.

Harold L. Blitch

We are in favor of aggressive management of the invasive weeds. These obstructive weeds should be removed with whatever means are necessary. These weeds affect recreational activities.

Scott and Niki Garris

This invasive weed is choking off the entire bay rendering docks and boating impossible, devaluing property as it is no longer water front with lake access. In as such, I believe Crested Floating Heart should be given utmost priority until we gain some manageable control.

Gerald Dunston

We are totally in favor of continuing the process to eliminate the weeds, especially in these residential areas. They may be good for the fish, but not good for those who have little ones swimming in the lake, as well as skiing and jet skiing.

Sandra Shumway

Our vote is definitely to spray these invaders, before we wish we had done something about them sooner. We have already experienced invasive weeds around our dock.

Raymond and Sue Barb

I am not an expert on the potential for these areas to house and attract snakes, but know that it has been raised as a concern by family and friends, especially those with small children. Additionally, the weeds create a snag for fishing lures that then pose a threat to children and adult swimmers that may step on the lure. While we are very appreciative of the natural beauty and vegetation around the lake, we whole-heartedly support the control and elimination of these nuisance weeds at and around private docks, and public landings to allow for the safe enjoyment of the recreational features offered by the lake.

John Scholz

I am writing this email to encourage you to please continue these efforts this calendar year in the airport slew of Lake Marion in Clarendon County.

Henry Boudreau

Let's continue to clean our lake of this terrible troublesome weed. The lake looks a lot better and I know it will continue to as long as we let it be known that we don't want something that would take over the water if allowed. Thanks DNR.

Katie Hatcher

I support your work with the invasive weeds. If I or the Goat Island Boat Club can be of help with this problem please let us know.

Carl Cagle

I love my lake and do not want weeds that do not belong there growing in the waters. I remember a time when it was hard to get out on Potato Creek for the Hydria growing. I stand on the side of dnr. and will help in any way I can to stop the growth of Hydria.

ktallyho@aol.com

As a waterfront resident of Lake Marion and a member of Goat Island Boat Club I want to express my continued support for 2013 SCDNR and Santee Cooper's efforts to control invasive plants in lakes Moultrie and Marion.

Debra Gleaton

Please do not let the invasive weeds spread into our lakes. We have had problems in the past and were not able to even get out boat away from our pier to enjoy our lakes. The children could not swim and spend time in the summer playing. People would fish near our pier and get their fish hooks caught in the weeds and leave the lines in the water and then the birds would get tangled up in them.

Marlene and Winston Hinds

I certainly want to see DNR put into effect any avenues possible to control the invasive weeds in the Santee Lakes. Thank you DNR for the efforts put forward to control ALL weeds.

Bobby Hodges

I have had to call on a couple of occasions about the weeds in the creek that I live on. I am glad that we can call and have someone spray these otherwise I would not be able to use Lizzie Creek to get out to Wyboo area. I would like to see this continue and to be sure that these weeds stay under control along with any of the others that prevent the recreational activities on the lake.

Kim McClamm

Please DO NOT STOP poisoning the uncontrollable weeds around docks on the Santee Cooper Lake System. Although I realize the fishermen appreciate these weeds for catching their fish, they also harbor snakes, alligators around area where children and adults are swimming and enjoying the water. There has to be a balance between the fishermen and the general public enjoying this recreational facility

Janet Lynam

As a full time resident with waterfront property on Lake Marion, I fully support the proposed plan to control invasive weeds in Lake Marion by use of spraying and carp.

Ted Brownell

I live on Lake Marion and am in favor of spraying for invasive weeds on the lake.

Sincerely,

Thomas J. Campbell

I am strongly supportive of efforts to control the weeds in the Wyboo section of Lake Marion... It is amazing how quickly the weeds grow and I am concerned that without a proactive approach and our current warm winter, this summer could be exceptionally bad.

Ronald D. Wilson

I would like to see the invasive weeds gone from the canal areas am a property owner and we bought in the area for the water not weeds.

Gerri White

CURRENTLY, FOUR OF THE SIX PROPERTIES ARE FOR SALE. THE MAIN REASON IS THE WEED PROBLEM AND THE LONG PERIODS OF NO WATER.

I UNDERSTAND THAT THAT THERE SEEMS TO BE SOME RIFT BETWEEN THE RECREATIONAL BOATERS AND THE HUNTER/FISHERMEN OVER THE CONTROL OF THE WEEDS. WHEN YOU CAN'T GET YOUR BOAT OUT OR NAVIGATE THE WATERS WHEN YOU DO, YOU CAN BE NEITHER...

DOES THE GOVERNING AUTHORITY HAVE A CLUE OF THE KINDS OF CHEMICALS THAT ARE BEING DUMPED INTO THE LAKE BY LANDOWNERS WITH THE BEST OF INTENTIONS IN AN EFFORT TO RID THEIR AREAS OF THESE PESKY WEEDS AND LILIE. DO ANY OF US REALLY WANT TO EAT FISH OR WILDLIFE THAT HAS BEEN EXPOSED TO SO MANY UNKNOWN CHEMICALS? IS THERE ANY LIABILITY ON THE STATE BY LETTING THESE PROBLEMS EXIST?

THERE ARE MANY LANDOWNERS WHO DO NOT HAVE THE LUXURY OF USING MANY DIFFERENT LANDINGS TO PUT THEIR BOATS IN THE LAKE. THEY HAVE PAID FOR THE RIGHT TO DOCK THEIR BOATS WHERE THEY OWN HOMES. MANY DO NOT HAVE TRAILERS. COULD THE LANDOWNERS BAND TOGETHER AND STOP PAYING THE LEASES UNTIL THERE WAS A REASON TO PAY THEM? WHAT WOULD SANTEE COOPER DO? IF THE LAKE IS IMPASSABLE, WHAT GOOD IS IT TO ANYONE? THE FAILURE TO CONTROL THESE WEEDS HAS TAKEN UNTOLD ENJOYMENT FROM COUNTLESS NUMBERS OF PEOPLE WHO PAY DEARLY FOR THE PRIVILEGE OF HAVING A PLACE ON THE LAKE.  
BOBBY AND JANICE WELCH

I am fully in support of eradicating the aquatic plants. They clog the waterways, prevent residents from using their watercraft, damage boats & jetskis and probably provide a haven for the snakes and alligators.

Annelle Powell

We are in full support of the controlling of the weeds in Lake Marion with chemicals or other methods to maintain clear clean water access. Last year we called and the weeds were sprayed. Thanks.....it helped a lot. Some of it did not die but everywhere they sprayed it did. We will see if it comes back this year. It is a reedy type grass. This past summer we started seeing snakes for the first time. I understand there is a new grass that is very hard to manage that has started

Bill Lynam

The weeds tend to attract snakes and this in return brings on the fear of alligators hiding. We don't feel safe enough to let the children swim around the pier. We watched numerous alligators last year getting very comfortable hanging around the pier and if these weeds are allowed to grow, we certainly can't see them.

Helen Welsh

We are in favor of Santee Cooper Property Management to continue their efforts to control weeds and algae in our lake system. We live on Lake Shore Drive in Manning and the problem became so severe this summer we were unable to use our waterfront after the end of June. I am also a Realtor and show waterfront property for sale. The majority of buyers are looking for a sandy beach with water their children can swim in and enjoy without the constant annoyance of weeds. We must keep the shorelines of property owners weed free or the values will be reduced even more so than they are now because of the economy.

Linda M. Lesemann

I agree with the need to control aquatic weed problem areas in Lake Marion.

William W Huffman II

Please consider this as my strong belief that Santee Cooper needs to aggressively work to fully combat invasive aquatic vegetation in the lakes. The "eel grass" has really become quite a problem in the Wyboo area, and perhaps other areas of Lake Marion as well. I sincerely hope that more aggressive treatment will take place during 2013.

Cliff Goodwin

I own a home in Frierson subdivision on the water and we have been taken over by this alligator grass around our dock and beach where our children and pets play. We have also spotted snakes and alligators this year which has been a problem before this grass appeared. I would be in favor of weed control, especially with the amount of taxes we pay each year for this property.

Chad Dowling

Please keep treating the weeds in the Wyboo area.

Ed Bynum

I am writing to say that as a homeowner in the wyboo area I am in complete support Of weed and grass control for the safety of those of us who love to swim around our dock area.

Charley moss

I support the draft aquatic management plan for 2013...The weeds in the cove are hampering recreational use.

Sandra & Wayne Smith

I do not feel like the suggested number of carp is sufficient to maintain enough SAV's to flourish the Santee Cooper lakes. Years ago, we had 20 times more waterfowl on the Santee Cooper lakes than today...However, it I believe the native submerged aquatic plant vegetation was a primary factor in the waterfowl numbers we used to see. Please make your best effort to increase the number of carp to eliminate hydrilla on the lakes so the natural SAV's can flourish like they need to.

Josh Britt

I support the draft aquatic management plan for 2013. In addition, how can I request aquatic weed control specific to my property.

Eddie Broyles

I support the draft aquatic management plan for 2013.

Ford7t1

You have my complete support to continue aquatic weed control in Lake Marion and especially in the wyboo area. It is a huge nuisance and must be stopped. Thanks for your help.

Paul Gaughf

I AM IN FAVOR OF THE SPRAYING!!

Gary Herlong

I am totally in support of all the weed control that is possible. We have significant problems even getting our boats in and out of our cove. My neighbor cannot even get his boat past my lot to his dock because of the weeds.

John Jackson

The weeds are a nuisance and greatly affect the ability to navigate to and from our property not to mention restricting recreational use. I am also an avid hunter and fisherman and understand the need for some vegetation but not in the recreational areas of the lake. If aggressive action is not taken soon the weeds will once again, as it did several years ago take over the lake.

Charles Bostic

I am in favor and appreciative of the efforts of Santee Cooper SCDNR to control the weeds and grasses in Lake Marion... the long grass grew so fast and consumed our swimming area. My girls swim in this area along the beach, and the grass not only is an irritant but also presents a danger. I believe this is also referred to as "Alligator Grass", and appropriately named, as this is the place the alligators lie in wait

Curt

During the summer of 2011, we experienced a rapid growth of an irritating aquatic weed which I refer to as eel weed. I called last year to Santee Cooper to request to have this weed possibly sprayed... I am an avid fisherman and I do understand the need for some vegetation to exist in our lake. The quantity of places to fish are much greater than there are to swim. I would further guess that the ones who want the weeds do not own property and pay property tax like I do on the lake in Clarendon County.

Please take into account my extreme desire to spray this weed to help eradicate it in our swimming and boating areas

Chris Alderman

We have had alot of lily pads in our slip the past few years and makes in very hard to get in and out. You did spray last year and it helped alot . i was hoping that you will be doing the same this year.

Tom Miller

I am a lakefront property owner on Lake Marion, and I strongly support spraying for the invasive weeds. I live on airport sleugh in Wyboo Plantation.

Ron Fulmer

I am in favor of and support DNR's plan for 2013 to control invasive weeds in our lake. I live on Taw Caw Creek and am so glad we have you to maintain control of these obnoxious weeds.  
Corrille DeWitt

Please consider my vote and support to the aquatic plant issue that we are having in our lakes. The different types of weeds seems to be getting worst every year.  
Dennis Craven

Homeowners and businesses alike suffer when the weeds choke out access to your property. Boating and fishing revenues go down when people can't enjoy the lakes due to weed infestations. I put my support completely behind the DNR experts and vote for their plan of action for this year.  
Dale Cozart

We have a "horrible" problem with Aquatic Weeds. We definitely support this Aquatic Weed Control Bill and request that you absolutely continue this program.  
William C. Grant

Need to reduce the aquatic weed at Santee! Please help  
Ronnie Grant

In my opinion, it is pointless to have a house on the lake if you cannot enjoy the lake. This past summer was very disappointing because we were very limited to how much we could actually use the water in front of our property. I even cancelled plans with some of my friends and family because of the large quantities of grass in the swimming area. It's a shame that Santee Cooper doesn't think enough of those that have property on the lake to resolve these issues. While I understand that there may be those that want the grass for fishing, there are many other places to fish on the lake that are not populated. I am sure that the majority of the residents would prefer that all of the grass be removed from around the docks and the swimming areas. If this problem is not resolved, I don't see myself being a home owner there for much longer. My vote - HAVE ALL OF THE GRASS REMOVED BY WHATEVER MEANS NECESSARY.  
John Capps

Please continue to keep lake clean.  
Keith Gibbons

As a waterfront property owner on Lake Marion I am in favor of spraying the lake for invasive weeds. I am close to losing my waterfront completely.  
Ron Rexroad

We have a "horrible" problem with Aquatic Weeds. Please see attached picture dated May 18, 2011. We definitely support this Aquatic Weed Control Bill and request that you absolutely continue this program.  
William J. Grant and Florrie Grant DeWitt

The lake has become overgrown with grassy weeds and algae in the last few years. It has become so bad that we are unable to use it for boating, fishing, swimming or any recreation besides sitting

next to it and enjoying the green algae smell. It may be that the weed problem is exacerbated by the exceptionally low lake levels we have experienced over the last few years.

Warren Wurscher

I agree that they should spray for the weed problem on the lakes

Rudy M Hearne

I am begging you to please continue to spray the weeds in the lake. I live on the first water going down 260 towards the dam. Right now I have a 100' dock and the weeds are all the way to the end of it, plus we have a large amount of gators that live in this water and they use the weeds to hide in. This I see as a very dangerous condition. I was going to walk on my dock one evening and just as I step foot on the wood an 8' gator rolled in the water not 5 feet from where I was standing. We cannot kill the gators but please make it harder for them to hide so close to land. Your help is greatly appreciated!

Jerri Rawls

I have a house on Church Branch / Coffey Street and I am in favor of weed control.

Key Thrasher

I'm in support of spraying the invasive weeds in the finger lake off of Lake Marion as long as it does not affect wildlife and fish stocks

Gayle Croom

I am supportive of your efforts to control the invasion of these non native weeds that are making boating, fishing and being able to dock at our dock without getting the prop wrapped up with weeds.

Michael Palladino

Last year we had lots of issues with our jet ski "clogging" up with weeds. It is imperative that "weed control" be maintained for this year and the many years to come.

Ken and Cathy Sharp

I have been living on the lake since 1981 and have never seen the weeds as bad as they are. The summer months used to be so exciting at my water front property, but now the weeds have taken all over it. Please take any measures to help this or at least control it better.

Kathie R. Ard

I am in favor and support DNR's plan to control invasive weeds. We are so fortunate to have such a beautiful lake in our backyard. As you know, the lake draws a number of visitors each year. Visitors spend money and boost our local economy with every tank of gas and bag of ice they purchase.

Wanda Johnson

I am in favor of DNR's proposed plan on invasive weeds in Lake Marion. The invasive weeds are killing recreation and most fishing, the more there are the less monies we receive in our county (Clarendon).

W, Harold Denny

I wanted to let you know that I am in favor of the DNR's plan on invasive WEEDS in Lake. I remember the Hydrilla problem, *and it almost killed recreation and fishing.*

*John Mathis*

I am in favor of DNR's proposed plan on invasive weeds in Lake Marion. I want my children to grow up enjoying the lake, but these weeds are everywhere!

Mrs. Miriam Johnson

I am in favor of DNR's proposed plan on invasive weeds in Lake Marion. The invasive weeds are killing recreation and most fishing, the more there are the less monies we receive in our county (Clarendon). DuValle Elliott

I am in very strong support of SC DNR's programs to control invasiv(es) Please do everything possible weeds in the Santee Cooper lakes of Moultrie and Marion.

John Roe

I am in favor of DNR's plan to control invasive weeds. They should definitely not be allowed to continue to multiply and choke our waters.

Jerry Hatcher

I fully support the program stopping the invasion of aquatic weeds! Keep up the good work.

Joe Campbell

I am in favor of DNR's proposed plan on controlling invasive weeds in Lake Marion. The invasive weeds are killing recreation and the quality of the fishing in our lake. The net result is less fishermen and less boaters and less money coming in to Clarendon County.

Tom Privette

I am in favor of DNR's proposed plan on invasive weeds in Lake Marion.

AMY LANE

Please stop the invasive weeds on Lake Marion. They are destroying fish and other aquatic life as well as ruining tourism and lowering home values.

Phyllis Wittschen

I am in favor of DNR's proposed plan on aquatic weeds in lake Marion.

Alfred H. Kelley

I do not know the name of the plant, but we have had EXTREME problems with a slick, slimy plant all along our shore line. It fouls propellers, feels absolutely awful on bare feet, thus discourages entering the water and multiplies very fast. We will appreciate it very much if you can do something to eliminate this problem!

H. B. Sprott, Jr.

### **Comments and Revisions:**

#### **Response:**

SCDNR and Santee Cooper continue to agree that we need aquatic vegetation in the Santee Cooper Lakes to have a great natural resource. We also agree that vegetation absolutely needs to be of the



native variety and not hydrilla. Eradication of established hydrilla utilizing current technology is virtually impossible. The goal of aquatic plant management on the Santee Cooper Lakes is to reduce hydrilla acreage while promoting a diverse natural habitat for fisheries, waterfowl and other animals. That goal is set forth in a Memorandum of Understanding between Santee Cooper and the SCDNR. The MOU provides for a minimum of 10% of the surface area of the lakes to be maintained with a diverse assemblage of native aquatic plants which includes a combination of submersed , floating leaf, and emergent plant species that provide habitat and food for game and non-game fish and wildlife species. According to a survey in the fall/winter, 21% of the Santee Cooper system has aquatic vegetation with over 8% of that being submersed native vegetation . These totals are well above the 10% minimum with almost that amount of native submersed vegetation alone.

The hydrilla increase is what is so problematic. Not only has the hydrilla acreage tripled to just over 3200 acres on the main lake system, It is actually replacing some of the native eel grass (*Vallisneria*) in some coves in lower Marion and upper Moultrie.

The consensus of those that disapprove of the plan seems to be in favor somewhat of controlling the invasive weed hydrilla while allowing native species to flourish. Generally the most unified approach by some of the commentators is to allow the 25 fish per vegetated acre for 3,244 acres( to move forward with disapproval towards the extra 47,900 fish directed towards the additional stocking rate of 10 fish per vegetated acre of about 4,790 acres of native pondweeds and naiads. The opinion is the stocking of this extra amount will definitely be detrimental to the ever increasing population of beneficial native vegetation. While those opinions contain merit it does not take into account the SCDNR and Santee Cooper's intent to monitor the progress of the carp's control and the potential negative impacts to native vegetation. The plan is not trying to eliminate the naiad or pond weed, but trying to account for the distraction it creates to hydrilla herbivory. Research is also currently underway by SCDNR fisheries staff to determine the most effective ways to reduce the grass carp population if they are effective on the hydrilla but have too great a negative impact on beneficial native species. Literature searches have come up with examples from Texas's Lake Conroe on efforts which target reduction of stocked carp in that system. This is a concerted effort to shift from a maintenance issue to a more aggressive approach to re-balance the system to reduce hydrilla while still promoting growth of native beneficial vegetation.

In order to enhance native plant growth and habitat, innovative management techniques shall continue to be utilized. Introduction of desirable native plant species, which enhancing wildlife and waterfowl management areas and implementing strategic lake level management measures will be continued in 2013. Those efforts include Santee Cooper and SCDNR staff; along with numerous concerned volunteers spending numerous hours on the lakes in an effort to harvest seed for additional plantings in the spring and summer. Techniques are have been developed for more efficient and effective planting techniques

Also included in the MOU is annual monitoring of the vegetative community and a cooperative effort to monitor the health of the fishery and waterfowl populations. The data derived from annual surveys will be utilized in an annual meeting between SCDNR and Santee Cooper to review the

results of monitoring and treatment programs and to determine the effectiveness of the programs and to develop annual work plans.

Sterile grass carp are utilized so that we may control their numbers in the lakes and eliminate an overabundance. Current research shows that the carp have an approximate mortality rate of 32% per year. Grass carp have been in the system throughout the entire recent period of vegetation expansion. Some \$400,000 was expended to determine the impacts of stocking grass carp in the Santee Cooper lakes, including impacts to fisheries, water quality, and vegetative coverage. Additionally, the U.S. Army Corps of Engineers developed and published a detailed Environmental Assessment for the use of grass carp to control hydrilla in South Carolina in both the late 1980's and again in 2005. The EA considered impacts to native fish populations, water quality, aquatic plant populations, as well as tourism and recreation (fishing, hunting and boating). Among other positive findings, the EA states that "sterile grass carp provide a safe, cost effective means of controlling nuisance aquatic vegetation in South Carolina. Once again, DNR and Santee Cooper are committed to protecting and enhancing the native vegetation community. We plan to continue to monitor their status and take corrective action if unnecessary impacts occur.

**Plan Modifications:**

None at present time.

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P.O. Box 167, Columbia, SC 2920

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